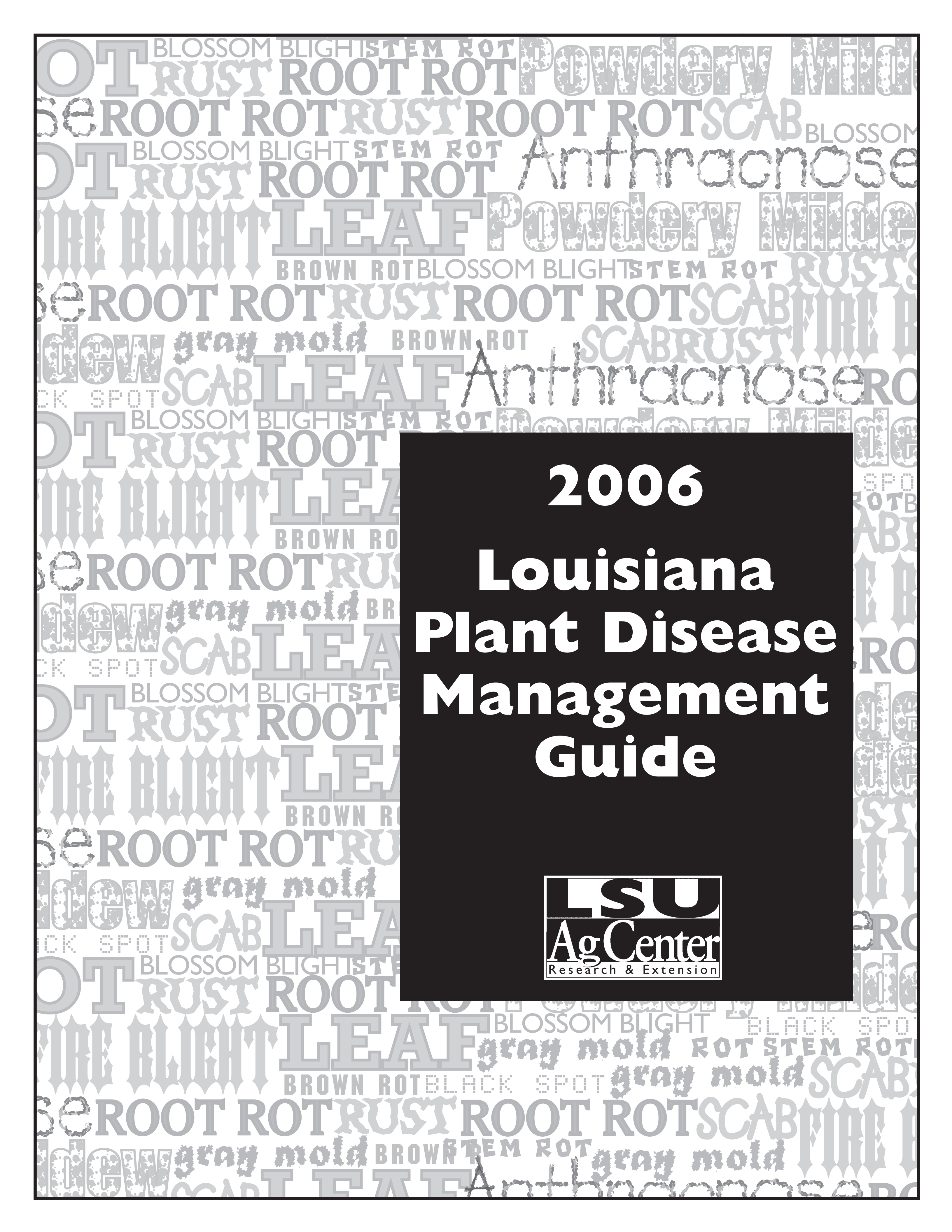

2006
Louisiana
Plant Disease
Management
Guide
LSU
AgCenter
Research & Extension

N O T I C E

Some of the pesticides or certain uses of pesticides in this publication may be classified for restricted use. It is unlawful for a non-certified applicator to use a pesticide which has been classified with restricted uses. Information on pesticide applicator certification programs may be obtained from the LSU AgCenter.

PLANT DISEASE MANAGEMENT GUIDE

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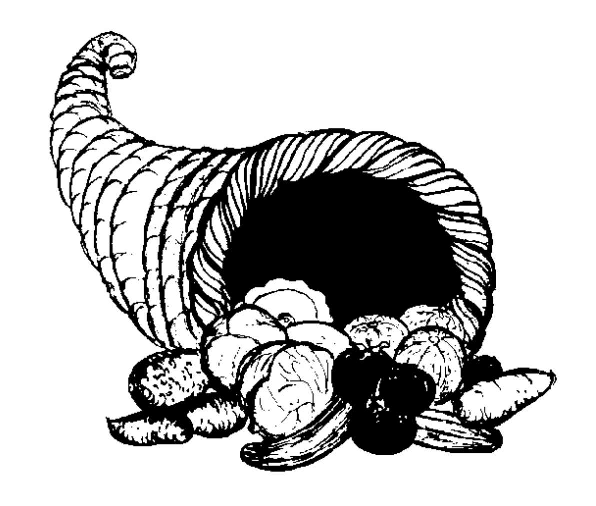
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Table of Contents

Introduction

This Plant Disease Management Guide is revised as needed. The most important or more prevalent diseases of the more common or important plants are included in this edition. The suggestions for disease management are based on the best information available. The management program in general is based on research conducted by Louisiana State University Agricultural Center personnel in the Agricultural Experiment Station, in cooperation with the USDA. In some cases, research results and plant disease guides from nearby states were used as a basis for the management measures suggested.

Many fungicides are sold for the control of plant diseases but, because of space limitations, only a few are listed. **Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement of particular products by the Louisiana State University Agricultural Center implied.** Always use pesticides safely. Read the label and follow safety precautions. Do not eat or smoke while applying pesticides. Pesticides should be stored in original containers and out of the reach of children, pets or livestock.



The Safe Use of Pesticides

General Safety Instructions:

Know the pest.

Use pesticides only when needed.

Always ask the advice of an authority on problems of pests and pesticides.

Use only the recommended pesticide for the problem.

Know how effective the pesticide is and any hazards it might present.

Read the label - read it all - even the small print.

Commercial pest control operators, farmers and other applicators of large quantities or organophosphorus pesticides should contact their physicians at the beginning of the season, or before using these materials, and submit to a blood test. At this time the person(s) should inform the physician of the types of pesticides he will be using. A good understanding should be established between the employer, the applicator and the physician regarding the availability of the physician's services and certain standard charges for such services. While discussing the pesticides to be used, be sure your physician has a current list of phone numbers for the Official Poison Information Centers in case he or she is not familiar with all of the types of pesticides, their antidotes, as well as signs and symptoms of pesticide poisoning.

Know what you are to do in the event of an accident. PLAN AHEAD. Call your physician immediately if an accident occurs.

Have your physician's phone number posted by your phone. In an emergency, time is extremely important.

Consider wearing a Medic-Alert emblem.

Take time to explain the safe use of pesticides to employees. Make sure they understand.

Check your application equipment for leaks, clogged lines, nozzles and strainers.

Calibrate your equipment frequently for proper output. Use water or other inert materials.

Check respirator for cleanliness, clean filter and proper fit.

Check gloves and other protective clothing for holes and cleanliness before each use.

Make sure plenty of clean water, soap, towels and a clean change of clothing are available.

Do not permit delivery of pesticides unless a responsible representative is on hand to receive and properly store them.

Make sure humans have been warned and livestock and pets that may be exposed have been removed from the area to be treated.

Cover food and water containers.

Check the label to make sure the time intervals between date of application and harvest, slaughter or milking will comply with those given on the label.

In Case of Poisoning

The National Pesticide Informational Center and the Louisiana Drug and Poison Information Center offer complete information on antidotes and treatments of pesticide poisoning, as well as other toxic materials.

National Pesticide Information Center

1-800-858-7378

(1-800-858-PEST)

6:30 a.m. - 4:30 p.m. PST - 7 Days a Week

National Tollfree Poison Control Center Hotline

1-800-222-1222

http://www.npic.orst.edu/

Louisiana Drug And Poison Information Center

1-800-256-9822 (Louisiana Only)
24 Hours A Day

318-342-1710 (Drug Information)
8:00 a.m. - 4:30 p.m. CST Monday - Friday

Instructions for Collection, Preparation and Shipping Plant Specimens to the Plant Disease Clinic

No one method of preparation for shipping of plant materials will assure their satisfactory arrival in the laboratory. Following the suggestions given below will ensure that specimens will be received in good condition.

Specimens completely desiccated or in advanced states of decay and those which arrive without supporting information will have to be discarded. This represents time and labor wasted for the sender and personnel at the LSU AgCenter. **Note:** Findings reported are necessarily based on examination of the material submitted. Some diagnoses require intensive studies. Because the time devoted to individual specimens must necessarily be limited, reports, while reflecting considered opinion and best judgment, may not always be statements of established fact. Follow instructions in the sections outlined below:

For Plant Disease Diagnosis

Plants showing wilting, yellowing or general decline:

l. Send whole plants including roots, if practical. Be sure to send plants showing early stages of disease.
2. Dig up carefully (don't pull up).
3. Send sample of soil and feeder roots in plastic bag. Seal to avoid loss of moisture.

Cankers:

1. Select specimens from recent infestations. Send entire cankered portion, if possible, with some of the healthy wood above and below the canker.
2. Branches and twigs that have been dead for several months are useless for identification.

Leaf spots:

l. Collect leaves showing early and late stages of infestation.
2. Press leaves between cardboard so they will not crumble.
3. It is usually not possible to diagnose marginal burning or other injury symptoms on leaves.

Fleshy organs:

l. Rots of fleshy fruits and vegetables need special attention. Do not send those in advanced stages of decay.
2. Select fresh specimens showing early symptoms.
3. Place specimens in plastic bag. Do not add extra moisture. Fleshy vegetables and fruit specimens should be wrapped separately. Keep cool until shipped.

Nematodes:

1. Late summer and fall are best times to take nematode samples.
2. Nematode samples require at least one pint of soil from approximately 20 random soil probes. Mix soil together and mail in plastic bag placed inside LSU AgCenter soil box.
3. Sample **must** be accompanied by nematode assay form with required information.
4. Protect sample from heat and light.

Packaging and mailing:

1. Enclose a **completed** Plant Disease Identification Form with each sample.
2. Wrap package in heavy paper. Attach envelope enclosing clinic form to outside of package.
3. Identify package with both outside and inside labels; don't put inside label in contact with moisture.
4. Address package to: Plant Disease Clinic, 302 Life Sciences Bldg., Baton Rouge, La. 70894-5100.
5. Mail packages to arrive on week days (Monday through Friday) rather than during weekend.

Remember: The better the specimens, the more accurate the diagnosis.

Field Crops
Corn

Disease

Maize Chlorotic Dwarf (Maize Chlorotic Dwarf Virus)	Symptoms: The first symptoms are chlorosis or faint yellowish stripes in the young leaves, may be followed by reddening or reddish-purple areas in the upper leaves. Diseased plants will have shortened internodes and small, numerous ears if infection occurs early. When young plants are infected, symptoms are more pronounced and plants are more severely affected. Source of Inoculum: Not transmitted through seeds nor carried by soil. Transmitted by leafhoppers from wild host. Johnsongrass is the main reservoir for the virus. Control: Plant varieties showing some degree of resistance. Follow a weed control program, especially for Johnsongrass.
Maize Dwarf Mosaic (Maize Dwarf Mosaic Virus)	Symptoms: Early symptoms are a shortening of upper internodes and a finely stippled mottle or mosaic of light and dark green on the youngest leaves. As plants mature, the mosaic disappears and leaves become yellowish-green and may show streaks of red. Source of Inoculum: MDMV is aphid transmitted. It infects Johnsongrass which may serve as a reservoir for the virus. Control: Resistant varieties offer the most promising approach to control. Control weeds in the field, especially Johnsongrass.
Fusarium Stalk Rot (*Fusarium* sp.)	Symptoms: Leaves of infected plants become grayish-green as plants approach maturity. Softening and discoloration of the exterior of lower internodes occur. When stalks are affected with stalk rot, they split and will generally show a reddish discoloration of the diseased area. Source of Inoculum: This fungus lives in old stubble or in the soil. Control: Practice crop rotation. Plow crop residue under. Make sure adequate potassium is applied with high nitrogen rates.
Charcoal Rot (*Macrophomina phaseolina)*	Symptoms: Injury from this disease usually does not become evident until plants approach maturity. Diseased plants exhibit poorly developed ears, premature ripening, lodging and drying of the stalk. Stalks are soft and discolored at the base, and the pith becomes shredded. Control: Rotate crops. Bury stubble. Maintain balanced potassium-nitrogen rates.
Southern Leaf Blight (*Helminthosporium maydis)*	Symptoms: Leaves of infected plants have numerous elongated spots between the veins. The spots are buff to reddish-brown. Source of Inoculum: Carried on the seed and in old plant refuse. Spores are readily windborne. Control: Use only seed produced by normal tasseling (N). The hybrids should also be ones recommended for your area.

Field Crops
Corn

Disease

Disease	
Common Rust (*Puccinia sorghi)*	Symptoms: Common rust is recognized by small oval to elongate pustules, which are at first cinnamon-brown, becoming brownish-black as the corn matures. The pustules may appear on any above ground part of the plant, but are most abundant on the leaves, being scattered over both surfaces. Source of Inoculum: Spores are usually wind blown from the south. An alternate host is the wood sorrel (*Oxalis* sp.). Control: Most hybrids are tolerant to this disease. Always use the recommended hybrids for your area.
Southern Rust (*Puccinia polysora*)	Symptoms: Southern rust is recognized by small circular to oval pustules, which are light cinnamon-brown. The pustules may appear on leaves and sheaths, but are most abundant on the leaves. Source of Inoculum: Spores are wind blown from the south. No alternate host is known. Control: Use hybrids tolerant to this disease.
Smut (*Ustilago maydis*)	Symptoms: All above-ground parts of the plant are susceptible, particularly the young, actively growing embryonic corn tissue. Symptoms are easily recognized. Galls are first covered with a glistening greenish- to silvery-white membrane. Except for galls on leaves, the interior of these galls soon darkens, with the membrane rupturing to expose millions of greasy to powdery, sooty spores know as chlamydospores or teliospores. Galls on leaves seldom develop beyond pea-size, becoming hard and dry without rupturing. Early infection may kill young plants, but not often. Control: Use hybrids recommended for your area. Most have adequate resistance.

Field Crops
Cotton

Diseases

Fusarium wilt (*Fusarium* sp.)	Symptoms: Plants are usually stunted and may fruit early; leaves may turn yellow, wilt and drop. Brown to dark-brown discoloration occurs on woody tissue just beneath the bark. It is more severe on sandy soils, during hot weather, and when root-knot or reniform nematodes are present. (See also root-knot nematodes below.) Source of Inoculum: Fungus lives indefinitely in soil. Nematodes, likewise, live over from year to year in the soil. Control: Use of tolerant varieties. Most recommended varieties exhibit tolerance to Fusarium wilt. Under more severe conditions use recommended nematicides. Refer to table on Nematode Control in Field Crops.
Verticillium Wilt (*Verticillium* sp.)	Symptoms: Leaf margins and between veins have pale yellow markings. Severely affected plants shed the young bolls. Light brown discoloration occurs in the interior woody tissue of the stem with little to no discoloration just beneath the bark. Occurs in cool weather with or without nematodes. Source of Inoculum: Fungus lives indefinitely in the soil. Control: Rotate with soybeans, corn, sorghum or small grain.
Root-knot nematodes[1] (*Meloidogyne* sp.)	Symptoms: Root systems are knotted or galled. Plants are stunted, slow growing and low yielding. Usually associated with a high incidence of Fusarium wilt. It is most severe on sandy soils. (See Fusarium wilt above.) Source of Inoculum: Root knot nematodes live over from year to year in the soil as eggs or larvae. Control: Use resistant variety. Apply nematicide. Refer to table on Nematode Control in Field Crops.
Reniform nematode[1] (*Rotylenchulus* sp.)	Symptoms: These nematodes cause severe stunting, reduced boll set and tight, locked bolls. Root systems are restricted but not knotted. May be found in mixed to heavy soil. Source of Inoculum: Reniform nematodes live over from year to year in the soil. Control: Apply nematicides. Refer to table on Nematode Control in Field Crops. There are no resistant varieties.
Seedling diseases[1] (*Rhizoctonia* spp., *Pythium* spp., *Fusarium* spp. and other fungi)	Symptoms: Loss before emergence is characterized by a rot of the seed or seedling. After emergence, affected seedlings have dark lesions on the stem, often girdling the stem and extending downward to and including the root system. Older plants have reddish-brown, sunken lesions near the soil line. Source of Inoculum: Some of the organisms causing seed rot and seedling diseases may be carried on the seed-coat while others live indefinitely in the soil. Control: Use only high quality seed. Plant seed only when soil temperatures at a 4" depth reach 68 degrees F for 3 to 4 days. Plant only treated seed. Prepare a good seedbed. Plant at proper depth for soil type and weather conditions. Use a recommended soil fungicide or fungicide-nematicide combination. See table on fungicides.

Field Crops
Cotton

Diseases

Boll Rots (many fungi and bacteria)	Symptoms: There is a wide range of symptoms since there are many organisms involved and many stages of boll development when damage may occur. Discolored, sunken areas may develop on the boll surface. Seed and fiber may be damaged without surface lesions on the boll. Fiber may be stained. Source of Inoculum: Organisms causing boll rots may be carried over in the soil, on crop debris or on the seed coat. Control: Avoid practices which promote excessively rank growth. Control insects during boll development. Plant growth regulators may be helpful in reducing in the incidence of boll rot when used in areas where rank growth usually occurs.

[1] Research indicates that the use of pesticide mixtures that contain chemicals with fungicidal, insecticidal and nematicidal activity increases the yield of early-planted cotton. The mechanism(s) by which the pesticide mixture increases yields in early-planted cotton has not been explained entirely.



Cotton Seedling Disease Control

Method of Application	Fungicide	Rate Per Acre
In-furrow spray	Mancozeb (Dithane DF, F-45, or M-45)	2 qts or 2 lbs
	Quadris F	5.5 ozs on 38" row
	Blocker 4F	1.5-3 pts/a
	Ridomil Gold	1- 2 ozs
	Ridomil Gold PC - Liquid	Jug to 5 acres
	Rovral 4F	5 ozs
	Terraclor 2E	2 qts
	Terraclor Super-X EC	2 qts
	Terraclor Super-X + Disyston	4-5.5 pts
In-furrow granules[1,2]	Terraclor Super-X 18.8 G	5.5-10 lbs
	Ridomil Gold PC-G	7-10 lbs
	Ridomil-Gold GR	1.25-2.5 lbs/a Used for Pythium only.
	Blocker 10G	10 lbs/a
Hopper-box	Apron-PCNB 6.25 - 25	8 ozs/100 lbs of seed
	Deltacoat AD	5.75-11.75 ozs/100 lbs of seed
	Mixtures containing 10% Terraclor (PCNB) + either Captan or thiram	Use 3 lbs of dust thoroughly mixed with seed. Concentrated formulations (30% dust) are available which may be used at a 1 lb rate.
	Terraclor Super-X (Dust) 20-5	1 lb
	Demosan (Dust)	1 lb
	Prevail	8-16 ozs/100 lbs of seed

[1] In-furrow sprays or granules may be used with insecticide-nematicides such as Temik or Nemacur.
[2] In-furrow granules may be applied into the hill drop mechanisms. In such cases reduce the amount of fungicide to 5- to 6-pounds per acre.

Field Crops
Grain Sorghum

Disease

Anthracnose (*Colletotrichum graminicola)*

Symptoms: Infection first appears on the leaves as small tan to reddish-purple circular spots, which later enlarge and may unite to involve large areas of the leaf. Later the center of the leaf spots fades to grayish-tan. Infection on the leaf midrib is strikingly discolored. The leaf anthracnose organism also causes a stalk rot. The stalk rot phase of this disease usually follows the anthracnose stage on the leaves. The fungus enters the stalk directly through the rind or a wound in the rind and spreads into the interior of the plant. The lesions that form on the outside of diseased stalks usually have reddish to purplish margins and whitish centers. When infected stalks are split, the pith is red or purplish-red. Diseased stalks frequently break over at the base or at a point one or more joints above the ground. Poor head and seed development results from severe infections. Control: Plant fungicide treated seed. Practice at least a 3-year rotation with other crops such as wheat, oats, barley, cotton and soybeans. Turn under old crop stubble after harvest.

Charcoal Rot (*Macrophomina phaseolina)*

Symptoms: Injury from this disease does not usually become evident until the plant approaches maturity. Affected plants show poorly developed heads, light kernels, premature ripening, drying of the stalk and lodging. Diseased stalks are soft and discolored at the base and the pith becomes shredded. Control: Follow the same practices suggested for anthracnose.

Downy Mildew (*Sclerospora* sp.)

Symptoms: Systemically diseased seedlings are yellowed, stunted and frequently have a white downy growth on the under-side of the yellowed leaves. Later the plants have green and white striped or mottled leaves. These plants may fail to head, produce sterile heads or form partially affected heads. Diseased plants are usually found in poorly drained areas. Control: Follow cultural practices outlined for anthracnose.

Head Blight (*Fusarium moniliforme Curvularia* sp. *Cladsporium* sp.)

Symptoms: Head blight is caused by several fungi from which infection occurs from flowering to maturity depending on high moisture conditions. (Fusarium head blight, the most destructive of sorghum head blights, occurs most commonly along the Gulf Coast production areas). The fungus is capable of infecting sorghum heads at and soon after blooming. Panicles and rachis branches become infected first followed by infection of stalk tissue at and immediately below the head. Weak neck and stalk lodging may follow. Control: While no hybrids are immune, some sustain less damage and less economic loss.

Gray Leaf Spot (*Cercospora sorghi)*

Symptoms: Small circular to elliptical dark purple or red spots appear on leaf surface. Later, center becomes tan or brown and spots elongate with gray spore masses covering the spots. Other hosts include corn, johnsongrass and cultivated grasses. Control: Most varieties have adequate tolerance to this disease.

Zonate Leaf Spot (*Gloeocercospora sorghi*)

Symptoms: On the leaves, circular, reddish-purple bands alternate with tan or straw-colored areas which give a concentric or zonate pattern with irregular borders. Spots may occur along the margins of leaves or on other plant parts. Control: Recommended varieties have some tolerance to the disease. Crop rotation and clean cultivation help.

Field Crops
Oats

Disease

Crown Rust
(*Puccinia coronata)*

Symptoms: Small, scattered, oval to oblong orange-yellow pustules develop principally on the leaves. Similar pustules may occur on the leaf sheaths, stems (culms) and panicles. The pustules soon break open to release a dusty mass of golden spores. Source of Inoculum: Source of spores causing primary infection in the fall in Louisiana is undetermined. Spread is by windborne spores. Control: Plant recommended varieties which have resistance to the prevalent races of the rust fungus.

Stem Rust
(*Puccinia graminis avenae)*

Symptoms: Elongated, reddish-brown pustules occur on the stem, leaf sheaths, leaf blades and glumes. Pustules rupture the epidermis to expose a powdery, reddish-brown mass of spores. Fragments of epidermis adhere to sides and ends of pustules to give them a ragged appearance. Source of Inoculum: Source of spores causing primary infection is undetermined. Has an alternate host, European or common barberry (*Berberis vulgaris*). Control: Plant recommended varieties which have resistance to the prevalent races of the rust fungus.

Yellow Dwarf
(Barley Yellow Dwarf Virus)

Symptoms: The most typical symptom is leaf discoloration. Affected oat plants may have leaves that are dull yellow to brilliant red. The red leaf color is not always present. Plants infected late may be stunted and have a reduced yield. Source of Inoculum: The virus may live in perennial grasses along fence rows and roadways. Spread is by aphids. Control: No practical control measure is available.

Leaf Blotch
(*Helminthosporium* sp.)

Symptoms: This fungus can cause seedling disease. On older plants the disease appears as reddish-brown, round to oval spots primarily on leaves and leaf sheaths but sometimes on stems and floret parts. Spots have irregular margins and frequent sunken centers. Long linear blotches result from merging of spots. Severely infected leaves turn yellow and die. Source of Inoculum: The fungus can live on seed and plant debris. Control: Rotate oat fields.

Field Crops
Peanuts

Disease	Chemicals & Formulations	Rate of Form. Mat	Remarks
Cercospora Leaf	Chlorothalonil	Mfg. Label	Start first application about the middle of July or when disease first appears. Repeat applications at 10 to 14 day intervals. Do not apply within 14 days of harvest. Do not allow livestock to graze treated areas. Do not feed hay or threshings from treated fields to livestock.
	Mancozeb 80WP	1-1/2-2 lbs	Same as above.
	Dithane F-45	.8 – 1.6 qts/A	Under severe disease conditions, reduce spray interval to every 7 to 10 days. If peanut vine hay is to be used for livestock feed, do not use more than 1-1/2 lbs per acre per application and do not apply within 14 days of harvest.
	Kocide	Follow Mfg. label.	Same as above.
	Headline	6.1 to 15.3 oz/a	Same as above.
Root Rot *Rhizoctonia sp.* *Pythium sp.*	Ridomil PC-11G	12.5 – 25 lbs/A	Apply in 9" band at planting. Incorporate 2 to 4 inches.
	Ridomil 5G	6.5 ozs/1000 linear Ft	Apply in 7" band at planting.
Pod Rot *Pythium sp.* *Rhizoctonia sp.*	Ridomil PC	50-100 lbs/A 22-43 ozs/1000 row Ft	Broadcast at early pegging.
	Ridomil 5G	13 ozs/1000 linear ft	Apply in 12" band at pegging. Do not apply to foliage. Irrigate following Application. For *Pythium* only.

Field Crops
Peanuts

Disease	Chemicals & Formulations	Rate of Form. Mat	Remarks
Pod Rot (con't)	Abound	18.5-24.6 ozs/A	Only 2 applications per year. No more than 50 days from harvest.
Stem Rot *Sclerotinia* sp. *Rhizoctonia* sp.	Folicur 3.6F	7.2 ozs/A	Make 4 consecutive Applications at 14-day intervals. See label for timing of applications.
Limb Rot *Rhizoctonia* sp.	Headline	6.1-15.3 oz/a	Follow label – 14 days of harvest.
	Rovral 4F	2 pts/A	14 to 21 day intervals.
	Abound	18.5-24.6 ozs/A	Make only 2 applications per year, 50 day cutoff. Apply after 60 to 90 days of planting.

Field Crops
Rice

Disease

Disease	
Blast (*Pyricularia grisea*)	Symptoms: Leaf lesions are spindle-shaped and elongated, with brown borders and grayish centers. A brownish lesion on the internode at the base of the panicle causes "blasting" of heads followed by breaking over of the head to produce the "rottenneck" symptoms. Source of Inoculum: Fungus may overwinter on diseased straw and stubble, or in some cases may be carried on infested or infected seed. Source of inoculum for early infection has not been satisfactorily worked out. Spread in the field by means of airborne spores. Control: For leaf stages of the disease, maintain proper flood level. Infection levels tend to be less severe where floodwater is maintained at adequate but not excessive depths. Plant varieties resistant to prevalent races of the fungus. (See Variety List.) Avoid excessive rates of nitrogen (nitrogen amounts vary with cropping history, soil type, varieties, etc.). The use of fungicides will be helpful in the management of blast. [3,4,5,6]
Sheath Blight (*Rhizoctonia solani*)	Symptoms: Large spots with cream-colored centers and broad, dark reddish-brown borders appear on sheath, usually beginning near the water line. Alternating wavelike tan and brown bands can extend up the sheath and may include the flag leaf. The wavelike band pattern may extend out on part or the entire leaf surface. Source of Inoculum: Fungus is soilborne and persists as sclerotia or mycelia on straw and stubble of rice and grasses. Weed hosts may serve as sources of inoculum. Control: Thick stands and excessive nitrogen applications tend to favor disease development. Fungicides may be necessary to suppress sheath blight development. [1 - 10]
Brown Spot (*Bipolaris oryzae*)	Symptoms: Dark reddish-brown spots somewhat circular or oval to slightly elongate. Mature spots have gray centers. Spots usually associated with low nitrogen or maturity of the plant. Spots may also occur on hulls and kernels with a dark brown fungus sometimes present on kernels. Source of Inoculum: The fungus is seedborne, and may also live from one crop to the next on infected rice straw and stubble. Spread by airborne spores. Control: Maintain good growing conditions through fertilization, land leveling, good soil preparation and other cultural practices.
Narrow Brown Spot (*Cercospora oryzae*)	Symptoms: Leaf spots are light reddish-brown to brown, long and narrow. Reddish-brown discoloration of the sheath may occur when disease pressure is severe. Usually occurs after heading. Source of Inoculum: The fungus persists on crop residue and on red rice. Control: Varietal resistance offers the best approach to control. (See Variety List.) Fungicides may control narrow brown leaf spot.

Field Crops
Rice

Disease

Seed and Seedling Diseases 1. Water mold (*Achlya* sp.) (*Pythium* sp.) 2. Seedling Blight (Several fungi)	Symptoms: Light to dark brown discoloration on soil surface around seed after water is removed. Usually have fluffy fungal growth around seed before water is removed. Usually have fluffy fungal growth around seed before water is removed. Source of Inoculum: These fungi persist in the soil on organic matter. Control: Removing water after seeding will reduce losses. Seeding into clear water reduces the incidence of water mold. Symptoms: Young plants have roots and lower stem affected, often resulting in death of the plant. Dark lesion at the junction of seed and root. Source of Inoculum: May be seed borne or soilborne.
Stem Rot (*Sclerotium oryzae)*	Symptoms: Black, discolored areas on leaf sheath near surface of water. Later small black seedlike sclerotia develop inside leaf sheath and still later inside the stem. Stalks may break over and lodge. Source of Inoculum: Fungus persists in the sclerotial stage in soil and on diseased straw and stubble. Control: Applications of potassium to the soil may reduce the severity of the disease in some instances.
Straighthead (Physiological Disorder)	Symptoms: Rice heads remain upright at maturity because of lack of grain formation. Hulls usually are crescent or "parrot beak" shaped. Source of Inoculum: No organism involved. Control: Drain water from field just prior to jointing stage of growth. Leave water off until cracks form in the mud, then reflood.

[1] Moncut fungicide has been effective in controlling sheath blight. Follow label directions. Recommended use for Louisiana is 0.7 – 1 lb. of product. If Moncut is the chosen fungicide to control sheath blight, applications may be made at first internode elongation followed by a second application at the same rate 10 to 14 days later.

[2] Tilt fungicide has been effective in controlling sheath blight, narrow brown spot and suppressing stem rot. Scouting for sheath blight should be done early. If Tilt is the chosen fungicide to control sheath blight, applications may be made using the following schedule.

a. 6 fl. ozs. per acre at first internode elongation (up to 2-inch panicle) and repeat at swollen boot. Make second application 10 to 14 days after the first application, but before the boot splits and head emerges.
b. 10 fl. ozs. per acre at internode elongation (up to 2-inch panicle). If disease reappears, use another registered fungicide for the second application.

[3] Quadris fungicide has been effective in controlling sheath blight and blast. Follow label directions. Quadris may be applied as early as PD + 5 days.

[4] Stratgeo fungicide may be used at the rate of 14.0 – 16 fl. ozs/A to control sheath blight and blast. Do not apply Stratego once the rice seed head has emerged. Do not apply within 35 days of harvest.

[5] Gem may be used at the rate of 8.0 – 9.8 ozs/A to control sheath blight and 6.4 – 9.8 ozs/A to control blast disease.

[6] Quilt may be used at the rate of 14 to 34.5 oz/A to control sheath blight or 28 to 34.5 oz/A to control blast. Do not apply when panicles are showing.

[7] Scouting for sheath blight should be done early. If 5% -10% of the tillers of a susceptible variety applied at the schedules listed above for each product.

[8] Bumper 41.8 EC may be used at the same rates as Tilt fungicide for sheath blight control.

[9] Propimax EC may be used at the the same rates as Tilt fungicide for sheath blight control.

[10] Rovral 4 Flowable may be used at the rate of 1 pt/A/application. The first foliar application should be made near booting; if a second application is needed, apply 14 days later but not past 75% heading.

Field Crops
Rice

Disease

Reaction of Rice Varieties Commonly Grown in Louisiana to Major Diseases and Disorders						
Cultivars	**Blast**	**Sheath Blight**	**Narrow Brown Leaf Spot**	**Bacterial Panicle Blight**	**Brown Leaf Spot**	**Leaf Smut**
Long Grain						
Banks	R	MR	R	MR	MR	MR
Cl 131	MS-S	VS	S	VS	-	-
Cl 161	S	VS	MS	S	MS	MS
CLXP730	R	MR	R	R	-	-
Cheniere	S	S-MS	MS	MS	MR	MR
Cocodrie	MS	VS	MR	S	MR	MS
Cybonnet	MR	S	MR	MS	R	MS
Cypress	S	VS	MR	VS	MR	MS
Della	S	MS	MR	-	S	MS
Dellmati	MR	MS	MR	-	-	MR
Dellrose	S	S	MR	-	S	MS
Jefferson	MS	S	MR	-	MR	MR
Spring	S	MS	MS	MS	-	-
Trenasse	MS	VS	MS	VS	-	-
TORO-2	R	S-MS	MS-MR	-	MS-MR	MS-MR
Wells	S	MS	R	VS	MS	MS
XP710	R	MR	R	MR	R	R
XP723	R	MR	R	R	R	R
CLXL8	MR	MS	R	R	R	R
Medium Grains						
Bengal	S	MS	MS	VS	MR	MS
Jupiter	R	MR	R	R	-	-
Medark	MR	MS	R	MS	MR	S
Pirogue	MR	MS	R	MR	MR	S
XP712	MR	MR	R	MR	MS	MR
R = Resistant, MR = Moderately Resistant, MS = Moderately susceptible, S = Susceptible and VS = Very Susceptible. Varieties labeled S or VS for a given disease may be severely damaged under conditions favoring disease development.						

Field Crops
Soybeans

Disease

Seedling Disease (*Rhizoctonia solani, Phytophthora, Pythium, etc.)*	Symptoms: Seed decay and postemergence "damping off." Roots and basal portion of stem may be killed. Source of Inoculum: Most of these organisms are soilborne and persist in crop residue. Control: Seed treatment.
Charcoal Rot (*Macrophomina* sp.)	Symptoms: Seedling infections result in a discoloration at the soil line. Seedlings may die if hot, dry conditions exist or survive in wet weather with disease symptoms reappearing during hot dry spells. In older plants, a light brown discoloration of internal tissue occurs. Plants turn yellow and "mature very early. Below the epidermis, at the soil line, small black bodies appear, giving the tissue a grayish-black "charcoal" appearance. Control: Avoid excessive seeding rates. Rotate with non-host crops. Maintaining good fertility will reduce the incidence of this disease. Avoid plant stress as much as possible by using good management practices.
Phytophthora Root Rot (P*hytophthora* sp.)	Symptoms: Destroys roots and tender stems of infected seedlings, resulting in rapid death. Older plants turn yellow and leaves wilt. A brown discoloration develops in the stem. Source of Inoculum: Soilborne. Damage is most severe on heavy clay soils or on poorly drained soils. Control: Avoid planting susceptible varieties on poorly drained soils. Rotate. (See Varietal Resistance Table.)
Red Crown Rot (Black Root Rot) (*Calonectria* sp.)	Symptoms: First symptoms appear as an interveinal yellowing of the tops of individual plants, generally when plants are in the early pod stage. Later, interveinal tissue of leaves turns brown followed by defoliation. On the stems, reddish-orange fruiting structures appear at the soil surface and up to 3 inches above. Stem tissue appears reddish. Control: Research and field observations indicate there are differences in varieties but exact ratings are difficult to achieve. Delay planting until later part of recommended planting time.
Southern Blight (*Sclerotium* sp.)	Symptoms: Scattered plants wilt suddenly and die. White mold appears at the base of the plant and girdles the stem. Tan to brown sclerotia (resting bodies) about the size of mustard seeds appear in the mold. Source of Inoculum: The fungus is soilborne and occurs widely in many soils. It is capable of persisting on almost any type of organic matter. Losses to this disease are usually very minimal and do not warrant control measures.
Aerial Blight[1] (*Rhizoctonia* sp.)	Symptoms: Typically the infected area involved the lower third of one or more of the three leaflets. The necrotic areas may vary in shape from circular to irregular with reddish-brown margins. Leaf blight, leaf spots and defoliation are symptoms of the disease. Lesions may vary from reddish-brown to brown or tan. Petioles, stems and young pods also are attacked. Source of Inoculum: Weed hosts, field trash and soil. Control: Fall cultivation of stubble. Use good seedbed preparation and weed control. Research and field observations indicate there are differences in varieties. (See Varietal Reaction Table.) Use Quadris fungicide at first appearance of disease and conditions favor disease development. See manfacturer's label for suggested rates.

Field Crops
Soybeans

Disease

Disease	Description
Brown Leaf Spot (*Septoria* sp.)	Symptoms: Angular brown to reddish-brown spots appear first on lower leaves causing yellowing, and later defoliation. Size of spots vary from pinpoint to ¼ inch in diameter. Source of Inoculum: The fungus overwinters in crop residue and in infected seed. Control: Plant disease-free seed. Rotate. Bury crop residue deep as soon as possible. Development of the disease is limited by warm weather.
Downy Mildew *(Peronospora* sp.)	Symptoms: Indefinite yellowish-green areas on upper leaf surface. Grayish tufts of mold growth on lower leaf surface beneath chlorotic spots. Source of Inoculum: Overwinters in soil, on seed and in soybean residue. Control: Crop rotation. Use of disease-free seed. Seed treatment reduces seedling infection.
Frogeye Spot[1] (*Cercospora* sp.)	Symptoms: An eyespot type of lesion with a gray or light tan center and a narrow reddish-brown border forms on the leaves. May cause premature defoliation. Source of Inoculum: Seed and airborne. Control: Use resistant varieties. Apply foliar fungicides.[1]
Purple Seed Stain[1] (*Cercospora* sp.)	Symptoms: Pink or light purple to dark purple discoloration of seed. Cracks may occur in discolored areas. Reddish-brown angular lesions, approximately 1/16 inch in diameter, may occur on leaves, stems or pods late in the growing season. Source of Inoculum: Overwinters on crop residue and in infected seed. Control: Plant disease-free seed. Treat seed with fungicides. Apply foliar fungicides.
Anthracnose[1] (*Colletotrichum* sp.)	Symptoms: Symptoms appear as irregular brown areas most frequently on stems and pods. In advanced stages, affected tissues are covered with black fruiting bodies. The disease may cause serious losses, especially during rainy periods. Seed may fail to form or be wrinkled and moldy. Control: Plant disease-free seed. Some benefit may be derived from seed treatment. Plow under crop residue. Apply foliar fungicides.[1]
Asian Soybean Rust (*Phakopsora pachyrhizi*)	Symptoms: Rust pustules can be found on the underside of lower leaves when conditions are correct for disease development. Pustules are tiny and rasied and require at least a 15X hand lens to see the pustules. Control: Fungicides will control ASR but timing is critical.
Pod and Stem Blight (*Diaporthe* sp.)	Symptoms: Numerous, small black fruiting bodies appear on the pods and stems of mature plants, blight usually in linear rows on the stem. Under favorabole environmental conditions for the disease, it can be observed as a white mycelial growth on seed. Source of Inoculum: Fungus is seedborne and overwinters on diseased plant tissue in the field. Control: Plant disease-free seed. Some benefit may be derived from the seed treatment. Apply foliar fungicides.
Stem Canker (D*iaporthe phaseolorum vr. caulivora)*	Symptoms: First symptom is the appearance of small reddish-brown lesions on one or both cotyledons. Late in the season, dead plants are seen with dried attached leaves. Infection usually starts as a small lesion at the leaf scar after the petiole has fallen. Lesions enlarge rapidly to form a slightly sunken reddish-brown canker. Plants are brittle and break at the canker. Control: Use resistant varieties. (See Varietal Reaction Chart for soybeans.) Delay planting until later part of recommended planting time. Avoid stress. Maintain good fertility.

Field Crops
Soybeans

Disease

Virus or Viruslike Disease Complex	<u>Symptoms</u>: Infected plants remain green, especially stems, beyond expected harvest date with welling appearing at the nodes. Few pods are formed and those contain only one or two beans. A proliferation of buds may appear. <u>Control</u>: Some of the casual agents are carried over in infected seed. Do not save seed from infected fields.
Reniform Nematode (*Rotylenchulus reniformus)*	<u>Symptoms</u>: Severely infected plants are stunted and may show chlorosis. Sever yield reduction may occur when nematode populations are relatively hgh. <u>Control</u>: Plant resistant varieties. Rotate with resistant crops. Under extreme conditions, use nematicides. (See Nematode Control Table).
Root Knot (*Meloidogyne incognita group)*	<u>Symptoms:</u> Above ground symptoms are poor pod set with wilting and stunting in more or less nematodes circular patches on lighter soil types. Below-ground symptoms are knots or galls on the roots. These swellings are a part of the root and do not “flick off” easily as bacterial nodules do. <u>Source of Inoculum</u>: The nematode overwinters in the soil as eggs or larvae. <u>Control</u>: See varietal resistance table. Rotate with less susceptible crops. Under extreme conditions, use nematicide. (See Nematode Control Table.)
Soybean Cyst Nematodes (*Heterodera glycines)*	<u>Symptoms</u>: Stunting and various stages of yellowing occur in roughly circular spots. Symptoms vary, depending on nematode population, soil type and fertility and environmental conditions. Symptoms are most pronounced on sandy soil. <u>Source of Inoculum</u>: Nematodes overwinter in soil, primarily inside resistant cysts. They may be spread to new locations by any means which spread soil. <u>Control:</u> Practice 2 to 4 year rotation with cotton, corn or sorghum. (see Nematode Control Table.)
Other Nematodes Spiral Lance Ring Lesion Stubby-root	<u>Symptoms</u>: Stunting, stand loss and reduced yields are associated with high populations of single or mixed populations of these nematodes. Symptoms will vary depending on nematode type and population levels. <u>Control</u>: Rotate with other crops. If populations are high at planting, a nematicide may be used.

Disease

Soybean fungicides and the diseases for which they are labeled.

azoxystrobin	Quadris	Aerial blight, rust Anthracnose, brown spot, cercospora blight, frogeye leaf spot, pod and stem blight	6.2 – 15.4 oz/ A 12.3 – 15.4 oz/A
azoxystrobin + propiconazole	Quilt	Rust	14 - 20 oz/A
chlorothalonil	Bravo Weather Stik Equus 720 SST Equus-DF	Anthracnose, pod and stem blight,frogeye leaf spot, purple seed stain, cercospora leaf spot, Septoria brown spot, rust Stem canker Antracnose, pod and stem blight, frogeye leaf spot, purple seed stain, cercospora leaf spot, sepotria brown spot Stem canker Rust Antracnose, pod and stem blight, frogeye leaf spot, purple seed stain, cercospora leaf spot, sepotria brown spot Stem canker Rust	No more than 6 lb/A/ season. 1 lb/A No more than 6 lb/A/season. 1 lb/A 1.37 – 2.25 lb/A No more than 5.4 lb/A/ season. 0.9 lb/A 1.25 -2.2 lb/A
myclobutanil	Laredo EC Fungicide Laredo EW	Rust Rust	4 -8 oz/A 4.8 – 9.6 fl oz/A
propiconazole	PropiMax EC Tilt	Rust Rust	4 – 8 oz/A 4 – 8 oz/A

Disease

Soybean fungicides and the diseases for which they are labeled. (continued)

propiconizole + trifloxystrobin	Stratego	Rust	5.5 – 10 oz/A
pyraclostrobin	Headline	Alternaria leaf spot, anthracnose, brown spot, cercospora blight, frogeye leaf spot, pod and stem blight, aerial blight, rust	6 -12 oz/A
pyraclostrobin + tebuconazole	Headline SBR	rust	7.8 fl oz/A
tebuconazole	Folicur 3.6F Orius 3.6F	Rust Rust	3 – 4 oz/A 3 – 4 oz/A
tetraconazole	Domark 230 ME Fungicide	Rust	4 – 6 oz/A

Field Crops
Sugarcane

Disease

Disease	Description
Leaf Scald (*Xanthomonas albilineans)*	Symptoms: Leaves of young plants may show bleaching or yellowing. The characteristic symptom of leaf scald is the presence of one or more narrow, white "pencil lines" running longitudinally down the leaf blade into the sheath. Bands of dead tissue may develop along pencil lines and expand until the entire leaf is dead. Young shoots may be killed. Mature stalks may show leaf symptoms and develop side shoots with symptoms. Under severe disease conditions, entire plants may die. Source of Inoculum: The bacterium lives from year to year in infected plants. It is spread by the harvester and possibly by other cultivation practices that cause plant wounding. The disease can be spread aerially in windblown rain. Control: Varietal resistance is the best means of control. Only one variety, LCP 85-384, exhibits resistance. Avoid planting seed cane from fields with diseased plants. The heat treatment used to control ratoon stunting disease is not effective against leaf scald.
Mosaic [1] (Sugarcane Mosaic Virus)	Symptoms: The mosaic pattern of irregular, indefinite, pale green to yellowish areas on leaves varies with cane variety, stage of growth, temperature and the strain of the virus involved. Source of Inoculum: The virus lives from year to year, primarily in infected canes. It is spread by aphids. Control: Plant varieties which have a low rate of disease spread including CP 70-321, LCP 85-384, HoCP 85-845 and LHo 83-153.
Ratoon Stunting Disease[1] (*Clavibacter xyli* subsp. *xyli)*	Symptoms: Plants may be shorter with little or no decrease in diameter of the stalk. Affected plants, when split, may show a pinkish color in the growing point of young shoots and orange to brownish discoloration of vascular bundles at the nodes in the lower portion of mature stalks. Source of Inoculum: The bacterium lives from year to year in infected canes. It is spread mainly by the cane harvester. Control: Heat treat seed cane with hot water at 50 degrees C for 2 hours, aerated steam at 53 degrees C for 4 hours (total time from commencement of treatment), or hot air at 54 degrees C for 8 hours in a tight box. Getting good control of RSD and obtaining a good plant cane stand from heat-treated cane can be problematic. Detailed recommendations for heat treatment to control RSD are available from the LSU AgCenter. Seed cane produced from tissue culture free of RSD is commercially available.
Red Rot (*Glomerella tucumanensis)*	Symptoms: Splitting of the infected plants shows a reddening of the tissues of the internodes and the presence within the red areas of white spots usually elongated at right angles to the long axis of the stalk. Source of Inoculum: Fungus survives from season to season in infected cane tissues. Control: Plant whole stalks and avoid planting heavily bored or physically damaged seed cane. Provide good drainage for seed cane.
Rust (*Puccinia melanocephala*	Symptoms: Small chlorotic areas appear on the leaves at first as flecks. Later, the flecks elongate and become reddish brown. The spots continue to enlarge, with a slight yellow halo surrounding the lesion on some varieties. The lesion takes on a pustular appearance and pustules burst, releasing a powdery mass of spores. On susceptible varieties, leaves turn brown and die. Control: Varieties with some susceptibility to rust are CP 70-321 and LCP 85-384.

[1]Sugarcane plants may become infected with both mosaic (SCMV) and RSD. When both are present, the resulting loss is greater than the sum of the individual losses added together. Thus, it is highly recommended that efforts be made to control RSD by heat treatment

Disease

Smut (*Ustilago scitaminea)*	Symptoms: Smut is characterized by the production of a whip-like structure at the apex of the stalk. The whip often elongates to a length of 2-3 feed and usually curls downward. The whip is covered by a layer of dark brown fungal spores. Spores are released and blown about in air currents and spread the disease over short or long distances. Control: For the best control of smut, grow resistant varieties with a high level of resistance of smut include: CP 70-321, CP 72-370, HoCP 85-845. CP 79-318, LCP 85-384 and LHo 83-153 are rated as intermediate. Other control measures include planting disease-free varieties next to smut-infected cane. Diseased stools in seed cane plots should be rogued.
White Stripe (Physiological Disorder)	Symptoms: Characterised by severe white striping on leaves in some stools, usually occurring in late spring. The white stripes extend the full length of the leaf. Striping can occur in all varieties. Striping is not considered infectious, but rather a growth response to environmental conditions. Occasionally, a plant may shrivel and die. Control: None. Plants will usually recover ater fertilizer effects are felt in the presence of adequate rainfall.

Field Crops
Wheat

Disease	
Leaf Rust (*Puccinia recondita)*	Symptoms: Leaf rust is widespread and probably is the most destructive disease on wheat in Louisiana. The leaf rust fungus produces small, yellow-orange pustules on the leaves. These masses of spores turn dark as wheat matures. Infection usually begins on lower leaves and spreads upward. Infected leaves turn yellow and die. Control: Resistant varieties (Table 1) are the most practical approach although fungicides may be used (Table 3).
Stem Rust (*Puccinia graminis tritici)*	Symptoms: Similar to stem rust of oats. Source of Inoculum: Has alternate host species of *Berberis* and *Mahonia* where new races may occur, but spread in this area is primarily from wheat to wheat. Control: Stem rust if a serious problem in localized regions of Louisiana. Resistant varieties are the most practical approach for control of this disease although fungicides may be used (Table 3).
Leaf and Glume Blotch (*Stagonospora* sp.)	Symptoms: The disease appears on the chaff and may be seen as small, irregular, grayish or brownish spots or blotches, which enlarge and become chocolate brown. As the spots age, their centers turn grayish white and may include tiny black spore-bearing bodies. Ordinarily only a few glumes in a head become infected, but in severe cases the entire head is attacked and turns dark brown. Spots on the sheaths are dark brown and often include most of each sheath. Spots on leaves are light colored and usually surrounded by a brown border. Control: Varieties differ in tolerance to leaf and glume blotch. Consult variety recommendations (Table 1). For fungicide recommendations, please refer to Table 3.
Powdery Mildew (*Erysiphe graminis tritici)*	Symptoms: Powdery mildew is usually found on leaves but may attack all above-ground parts of the plant. It first appears as small irregular or circular light gray spots on the upper leaf surface. Later the plant is covered with a “floury” appearance. Leaves eventually become misshapened and die. Control: The application of fungicide for the control of powdery mildew has rarely been economical.
Bacterial Streak/Black Chaff (*Xanthomonas campestris pv. translucens)*	Symptoms: Symptoms on leaves begin a dark-green, water-soaked spots that eventually become necrotic and develop into streaks. On the heads, black chaff appears as stripes on the glumes, but blackening may be total. Control: Use crop rotation, clean tillage and pathogen-free seed.
Fusarium Head Blight/ Scab (*Fusarium* spp.)	Symptoms: The symptoms after flowering appear as a bleaching of the glumes, spikelets, areas of the head or even the entire head. Salmon-red or pink-red spore masses frequently form on infected heads. Control: Seed treatment fungicides help, but do not entirely eliminate, the fungus.
Stripe Rust (*Puccina striiformis)*	Symptoms: The first sign of disease is individual yellow pustules, usually at the top of the leaf. Later, pustules will develop in rows giving the characteristic of resistant striped appearenced. Leaves, sheaths, stems and glumes may be attacked. Control: Resistant varieties are the most practical approach for control of this disease, although fungicides may be used (Table 3).

Field Crops
Wheat

Disease

Disease	
Take – All (*Gaeumannomyces graminis)*	Symptoms: Affected plants have shortened, bleached heads that stand erect and are distributed irregularly throughout the field. The stem base is black-brown and the roots show dark discoloration and are extensively rotted. Control: Maintain balanced soil fertility, and use seed treatment fungicides (Table 2).
Tan Spot (*Pyrenophora triticirepentis)*	Tan spot first appears on the lower leaves as small yellow-brown spots that develop into oval spots. Lesion centers become tan and are usually surrounded by a yellow border or halo. As the leaf declines, the spots expand and merge into irregular tan to brown lesions. Control: Deep plow crop residues. Fungicide Tilt or mancozeb may be used.
Yellow Dwarf (BYDV)	Symptoms: Leaf discoloration in shades of yellow, red or purple, especially from tip to base and from margin to mid-rib. Stunting and excessive tillering are noted. White sterile heads may develop. Control: No adequate controls.

Table 1. Wheat varieties and their disease reaction.

Variety	Leaf Rust[2]	Stagonospora Complex[3]	Bacterial Streak/ Black Chaff[3]
AgriPro/Mason[4]	10	4	4
AgriPro/Natchez	1	3	4
AGS 2000	3	4	4
LA 90518	0	4	4
NK/Coker 9663[4]	12	4	5
Pioneer/26R61[4]	9	3	2
SS 518	1	4	5
SS 522	0	4	4
Terral LA422	1	4	4
USG 3209	3	4	4
Promising			
DK 9410	5	3	2
HBK X3030	4	3	2
NK/Coker 9152	0	4	3

[1]Disease ratings are based on date from all reporting stations during the last two years for promising varieties and the last three years for other varieties. All diseases are not equal in importance. To choose a variety based on disease ratings, do not add the ratings across disease for each variey. More weight should be given to the predominant diseases in your area.
[2]Leaf rust ratings are expressed as a percent of leaf area covered.
[3]Stagonospora Complex and Bacterial Streak/Black Chaff ratings are based on 0 = 9 scale where 0 = no disease and 9 = severe disease. The single digit Bacterial Streak/Black Chaff rating indicates the severity of the disease on the head and flag leaf.
[4]Severe rust has been observed on these varieties. Severe yield losses can be expected during severe epidemics.

Table 2. Fungicides to manage seed and seedling disease in wheat.

Product	Rate/Acre	Disease/Organism
Apron XL LS	0.32-0.64 fl. oz/cwt	*Pythium* sp.
Dividend XL Dividend XL RTA	1 fl. oz./cwt. 5 fl. oz/cwt.	Loose smut, general seed rots
ManKocide	4 ozs/cwt	Bacterial diseases
Manex	2 – 3.2 oz./bu.	Damping-Off Seed rot Seedling Blight
Maxim 4FS Maxim XL	0.08-0.16 fl. oz./cwt 0.167-0.334 fl. oz/cwt	Damping off
System 3	2-3 oz/bu	Damping off
Vitavax-CT Vitavax M	9-12 oz/cwt. 9-12 oz./cwt.	Loose smut

Table 3. Fungicides to manage diseases in wheat.

Disease/Organism	Product	Rate/Acre
Rust (leaf, stripe, stem)	Dithane DF Rainshield	2.1 lb
	Dithane F-45 Rainshield	1.6 qt.
	Dithane M-45	2 lb
	Headline	6-9 oz(through FGS 10.53)
	Manzate 75 DF	2 lb
	Manzate 80 WP	2 lb
	Manzate Flowable	1.6 qt
	PropiMaxx EC	4 oz(through FGS 8)
	Quadris	6.2-10.8 oz
	Stratego	10 oz (through FGS 8)
	Tilt	4 oz (through FGS 8)
Stagonospora (*Septoria*) Leaf Blotch and Glume Blotch	Dithane DF Rainshield	2.1 lb
	Dithane F-45 Rainshield	1.6 qt.
	Dithane M-45	2 lb
	Headline	6-9 oz(through FGS 10.53)
	Kocide 101	1.5-2 lb (leaf blotch only)
	Kocide 2000	1.25-1.5 lb (leaf blotch only)
	Kocide 4.5 LF	1-1.33 pt (leaf blotch only)
	Manzate 75 DF	2 lb
	Manzate 80 WP	2 lb
	Manzate Flowable	1.6 qt
	Nu-cop 3L	1-1.33 pt
	Nu-cop 50	1.5-2 lb
	PropiMaxx EC	4 oz(through FGS 8)
	Quadris	6.2-10.8 oz
	Stratego	10 oz (through FGS 8)
	Tilt	4 oz (through FGS 8)

Fruit Crops

Apple

Bitter Rot (*Glomerella* sp.)	Symptoms: The disease affects the fruit as it approaches maturity. It forms sunken, more or less soft and watery, pinkish to brown rot spots on the fruit. Late cover sprays are important. The rotted tissue has a bitter taste. Control: Growers following apple spray schedule should obtain limited control of bitter rot.
Blotch (*Phyllosticta* sp.)	Symptoms: Dark-brown to black blotches with irregular margins on the fruit. Small angular spots on the leaves and cankers on the twigs. Control: See Bitter Rot above.
Rust (*Gymnosporangium* sp.)	Symptoms: The rust fungus passes part of its life on cedars forming the familiar "cedar apples" and part of its life cycle on apple or crab apple causing rusty spots on the leaves and fruits. Rust can be avoided by eradicating cedar trees within two miles of apples.
Fire Blight (*Erwinia* sp.)	See Pear for symptoms and control.

Fungicides Labeled for Use in Controlling Apple Diseases

The following products are labeled for control of apple diseases in Louisiana. Follow manufacturer's label and alternate pesticides for most effective results.

Disease	Fungicide	Remarks
Anthracnose Blossom Blast Fire Blight	Fixed Copper (Kocide 2000, Kocide DF, Nu-Cop) Aliette WDG	Follow manufacturer's label. Aliette for suppression of Fire Blight
Phytophthora (Root and Collar Rot)	Ridomil Gold Aliette WDG	Follow manufacturer's label. Follow manufacturer's label.
Rust Scab Early Leaf Spot Sooty Blotch	Maneb 80WP Man-co-Zeb DF	Do not exceed 24 lbs product per year.
Scab Bitter Rot Powdery Mildew Black Rot Sooty Blotch	Topsin-M 70W Thiophanate-methyl-70W	Use higher rates and shorter intervals Under severe disease conditions.
Scab Black Rot Botrytis Rot Bitter Rot Sooty Blotch	Captan 50W Captan 80W Captec 4L	Do not apply within 1 day of harvest. See manufacturer's label.
Rust Powdery Mildew	Nova 40W	Do not apply more than 5 lbs Nova Fungicide per season.
Rust Black Rot Powdery Mildew Sooty Blotch Scab	Sovran Flint 50W	Do not apply within 30 days of harvest. Do not apply as the final spray in the season. 12 hr Restricted-entry interval Do not apply Flint with 14 days of harvest.

Fruit Crops
Blackberries

Fungicides Labeled For Use in Controlling Blackberry Diseases

Crop	Disease	Fungicide	Rate	Remarks
Blackberry Caneberries	Boytris	Captan Elevate Rovral Stretch Switch	See Mfg. label	Apply at bloom and at 14-day intervals.
	Leaf Spot Cane Spot	Fixed Copper	See Mfg. label	Fixed copper fungicides labeled on blackberries include Kocide DF, LF, 101, 2000, Nu-Cop 3L and Nu-Cop 50DF.
	Rust	Cabrio Nova Pristine Fixed Copper	See Mfg. label	Begin application at budbreak. Continue at 10-to-14 day intervals.
	Phytophthora Root Rot	Alliette Helena Prophyt Phostrol	See Mfg. label	Begin in spring after bud break. Continue on 45-60 day schedule. 60 day harvest cut off.
	Anthracnose Alternaria Leaf Spot Blotch	Abound Cabrio Captan Pristine Switch Fixed Copper	See Mfg. label	
	Double blossom (rosette)	Abound	6.2 – 15.4 fl. oz. / A	Begin at onset of disease and as required throughout season.

Fruit Crops
Blueberries

Blueberry Spray Program

Timing	Pest	Pesticide	Amt/ 100 gal	Remarks
Pre-Bloom Sprays				
1. Green Tip	Mummy Berry	Abound Bravo or Equus Captan Captevate Pristine Switch Ziram	See Mfg. label	
2. 7-14 days later	Mummy Berry	Abound Bravo or Equus Captan Captevate Pristine Switch Ziram	See Mfg. label	
Bloom Sprays				
3. 10 - 20% Bloom	Mummy Berry	Abound Bravo or Equus Captan Captevate Pristine Switch Ziram	See Mfg. label	
4. Full Bloom	Mummy Berry	Abound Bravo or Equus Captan Captevate Pristine Switch Ziram	See Mfg. label	
Petal Fall Sprays				
5. Immediately After Bloom	Fruit Rots	Cabrio Captan Captevate Pristine Rovral Switch Ziram	See Mfg. label	Rovral for Botrytis only.

Fruit Crops
Blueberries

6. 10-14 days later	Fruit Rots Leaf Spots	Cabrio Captan Captevate Pristine Rovral Switch Ziram	See Mfg. label	Rovral for Botrytis only.
7. 10-14 days later	Fruit Rots Leaf Spots	Cabrio Captan Captevate Pristine Rovral Switch Ziram	See Mfg. label	Rovral for Botrytis only.
Fall Sprays	Bacterial Canker	Fixed Copper (Kocide 2000, Kocide DF, Nu-Cop 3L)	See Mfg. label	Make 2 sprays in fall 4 weeks apart.
Spring (before root growth)	Phytophthora Root Rot	Aliette or Helena Prophyt or Phostrol Ridomil Gold EC	See Mfg. label	See manufacturer's label for instructions.

Fruit Crops
Citrus

Melanose (*Diaporthe* sp.)	Symptoms: Melanose is caused by a fungus (*Diaporthe citri)*, and it also affects the leaves, shoots and fruit. It forms numerous, dark brown dots or spots on the leaves, young shoots and fruit. These spots are at first sunken, but later become raised so that the russeted area has a rough, sandpaper feel. The spots may be irregularly scattered on the surface of the fruit or they can run in streaks (tear stains). Like scab, melanose infection occurs only on the young, tender growth. The fruit becomes progressively resistant with age. However, the same fungus that causes melanose can infect the ripe fruit after harvest. It is one of the two most common causes of the very destructive fruit decay known as stem-end rot. Control of melanose, therefore, helps to reduce the losses from stem-end rot. Control: Prune and burn the dead wood. This practice eliminates much of the source of infection. Follow Citrus Spray Schedule.
Scab (*Sphaceloma* sp.)	Symptoms: Scab is primarily a disease of Satsuma, orange, tangerine, grapefruit, lemon, sour orange and trifoliate orange root stock. It does not affect the sweet orange. Scab affects fruit leaves and young shoots, causing irregular, raised, corky, scabby, wart-like outgrowths. Severely scabbed leaves and fruits become misshapen and distorted. The rind of scabbed fruit is thick and puffy. Control: Follow Citrus Spray Schedule.
Sooty Mold (*Capnodium* sp.)	Symptoms: The sooty mold fungus (*Capnodium citri)* is not a parsitic organism. It does not penetrate the tissue of the plant but grows superficially on the honeydew excretions of white flies, aphids, mealy bugs and scale insects. Soty mold cause a certain degree of injury, when its growth is very thick, by preventing the sunlight from reaching the leaf and by making the fruit black and unattractive. Fruit covered with sooty mold is smaller and does not color well. Control: Follow Citrus Spray Schedule.
Green Mold Blue Mold (*Penicillium* sp.)	Symptoms: The fungus enters the fruit through injuries to the skin. Decay appears as a softened water-soaked area that is easily punctured by pressure. Later white mycelium appears on the surface and soon a mass of powdery olive-green (green mold) or blue spores (blue mold). Control: Follow Citrus Spray Schedule.
Sour Rot (*Geotrichum citri)*	Symptoms: Lesions appear as soft water-soaked spots on fruit at points where injury has occurred and may increase to involve the entire fruit. White fungal growth develops on the surface of the infected fruit. A strong sour odor is present. Control: Prevent injury of fruit at harvest. Follow Citrus Spray Schedule.

Louisiana Citrus Disease Spray Schedule

Selection of proper materials and timing of application are of prime importance for effective control in insects and diseases of citrus.

Time	Crops	Pesticides & Formulation	Amt/100gals	Pests to Control	Remarks
1. Pre-bloom	Satsuma Grapefruit Oranges	Fixed Copper. (See appendix for list of fixed coppers.) Abound or Gem or Headline	See Mfg. label	Scab Melanose	Do not mix copper with other pesticides. Since neutral copper can be purchased in various formulations, see label on container for amount to use. A nutritional mixture may be added if desired. Do not use more than 4 times per season. Do not use within 7 days of harvest. Do not use on tangerine, tangelos, Red grapefruit or Red Blush grapefruit.
2. Early Bloom	Oranges Grapefruit	Abound or Gem or Headline	See Mfg. label	Anthracnose (Blossom Blight, Twig Blight) Post-bloom Fruit Drop	Do not use copper during bloom.
3. Late Bloom (Petal Fall)	All Citrus	Abound or Gem or Headline	See Mfg. label	Melanose Scab Alternaria Leaf Spot Post Bloom Fruit Drop Greasy Spot	Alternate with other fungicides. Begin application prior to disease development. Do not use more that 2.88 qts/A per season.
4. Post Bloom	All Citrus	Fixed Copper. Abound or Gem or Headline	See Mfg. label	Scab Melanose	Make 2 applications. Spray the first at pea-size fruit and the second 14 – 21 days later. Time applications to follow rain events, if possible. Large trees may require 200-300 gallons per acre for good coverage. Do not mix copper with other pesticides. Do not apply copper during full bloom. Do not use where shrimp or crawfish would be affected.
5. June 15 to July 15	All Citrus	Fixed Copper Abound or Gem or Headline	See Mfg. label.	Scab Melanose	Do not mix copper with other fungicides.
6. Oct. 15 to Nov. 15	All Citrus	Fixed Copper Aliette or Helena Prophyt or Phostrol	See Mfg. label	Brown Rot	Apply anytime from 3 weeks prior to harvest up to day of harvest. Apply as foliar spray when conditions favor disease development.
7. Soil Treatment	Citrus Nursery stock	Ridomil Gold or Ridomil G Aliette or Helena Prophyt or Phostrol Subdue Maxx Subdue G	See Mfg. label	Phytophthora Footrot	Make no more than 3 applications per year. May make 2-3 applications per year. May be applied to individual trees. Rate depends on tree size. See mfg. label. Apply as foliar spray when conditions favor disease development. Do not exceed 4 applications per year. Do not apply within 30 days of harvest.

NOTE: Add a spreader sticker or liquid soap to spray mixture to obtain better coverage, especially with emulsifiable concentraqtes.
CAUTION: Oil emulsion sprays should not be applied to drought-stricken trees when temperature is above 85 degrees F and humidity is 30 percent or less. Oil emulsion sprays applied after August 15 may be inhibit solid formation, retard coloring of frut and reduce tolerance of the trees to cold. Follow specific instructions on the label of all pesticides.
WARNING: Reentry times for workers entering groves or treated fields should be strictly observed. Be sure to check the label for this information.

Fruit Crops
Grapes

Anthracnose (*Elsinoe* sp.)	Symptoms: Fruit infections have light gray centers and reddish-brown borders resembling a bird's eye. Stem lesions are similar in color, sunken, with slightly raised borders. Leaf spots are gray with dark borders; later the center of the lesion drops out, giving a regged effect. Badly infected leaves become distorted and curl down. Control: Follow Grape Spray Schedule.
Black Rot (*Guignardia* sp.)	Symptoms: The black rot fungus attacks all parts of the grape plant. Leaf infection appears on the upper surface in early June as tiny reddish-brown spots. The lesions enlarge to one-fourth inch or more in diameter and become brown with black borders. A ring of black fungus bodies develops near the outer edge of the brown area. Lesions on stems and tendrils are longer and darker than those on leaves. Stem lesions are narrow, sunken and often split length wise on the vine. Infections begin to appear on the fruit when the berries are about half grown. At first a small white spot forms. It enlarges rapidly until the entire berry is rotted. Affected berries soon turn black, shrivel and dry up. Minute black fungus fruiting bodies develop on the surface of the dried fruit. Control: Follow Grape Spray Schedule.
Pierce's Disease (*Xylella fastidiosa*)	Symptoms: Symptos may vary, but generally are characterized by a scorching of the leaf margins. Grape clusters wilt and dry; bud leaves are slow to develop and show water stress during dry periods. The disease is transmitted by a number of leafhopper vectors. Control: No practical control is available. Limiting the spread of the insect vector and destruction of wild weed host have had limited success. Destroy infected plants.

Grapes

The following products are labeled for control of grape diseases in Louisiana. Follow manufacturer's label and alternate pesticides for most effective results.

Disease	Fungicide	Remarks
Black Rot	Abound or Flint Or Bayleton 50DF Or Fixed Copper Or Nova 40W Elite 45 W	Alternate with other fungicides. 14 days PHI[1], 12 hr REI [1] Do not apply within 14 days of harvest. Maximum of 18 ozs Bayleton per season. 12 hr. REI Fixed coppers labeled on grapes include Kocide 101, 2000, DF, LF, Nu-Cop 3L and Nu-Cop 50DF. Do not apply more than 18 lbs active per season. 14 day PHI, 24 hr REI
Boytris Bunch Rot	Flint 50E or Elevate 50WDG Or Rovral 4f Vangard	Apply at early bloom, bunch pre-close, beginning of fruit ripening. 4hr REI, 0 day PHI. Follow manufacter's label. Apply no more than 4 times. 12 hr REI, 7 days PHI for Rovral.
Anthracnose	Nova 40W	10-14 day intervals. Apply to fruit prior to harvest or to protect vines after harvest.
Powdery Mildew	Abound Or Rubigan Fixed Copper Or Procure 50S Or Bayleton 50DF Or Nova 40W Elite 45W	Do not put out more than 6 applications per year of Abound. See manufacturer's label. Do not apply more than 1.5 lbs. per year.
Phomopsis Cane Blight	Abound Or Flint Or Captan 50W Or Captan 80W	Do not apply more than twice in sequence without alternating. Use higher rates on susceptible varieties.
Downy Mildew	Captan 50W Or Abound Or Captan 80W Or Ridomil Gold Copper Or Ridomil Gold MZ Or Fixed Copper	10-14 day intervals. Do not use more than 24 lbs. Captan 50W per season. Do not use more than 15 lbs Captan 80W per season Do not apply within 66 days of harvest. 48 hrs REI Mfg. directions

[1]PHI – Pre harvest interval
[2]REI – Restricted-entry interval

Fruit Crops
Mayhaws

Fungicides labeled for controlling Mayhaw diseases.			
Disease	**Fungicide**	**Rate**	**Remarks**
Rusts	Nova	1.25 – 2 ozs/100 gals	Begin application at ½ in. green and repeat at 10-14 day intervals. 24 hr REI[1], 14 days PHI[2]
	Flint	2 – 2.5 oz/A	Alternate Flint with other fungicides
	Sovran	3.2 - 6.4 ozs/A	For suppression of quince rust; 30 days PHI
Powdery Mildew	Sovran	4 - 6.4 ozs/A	2 hr REI, 30 days PHI
	Flint	2-2.5 oz/A	Alternate Flint with other fungicides
	Nova	1.25-2.5 ozs/100 gals	14 days PHI
Fireblight	Aliette or Phosphite or Helena Prophyt or Phostrol	See Mfg. label	Begin when flowering or rapid stem growth is occurring. Re-apply at 4 – 7 day intervals during conditions favorable for fireblight development. Periods of heavy rainfall are favorable to fireblight. 12 hr REI, 14 days PHI. Aliette, etc., in a program with recommended sanitation measures aids in control of fireblight.

[1]PHI – Pre harvest interval
[2]REI – Restricted-entry interval

Fruit Crops
Peaches and Plums

Disease	
Bacterial Spot (*Xanthomonas pruni)*	Symptoms: The disease affects both peaches and plums. It occurs on leaves, twigs and fruit. Spots on leaves progress from pale green to deep purple, brown or black and angular in shape. Spots fall out to give "shot-hole" appearance. Peach fruit are roughened with cracked, sunken spots. Small, thick-edged depressed spots occur on twigs and larger spots or cankers occur on branches or trunk. Source of Inoculum: Bacteria live from one year to the next in twig cankers. Control: Obtain healthy vigorous nursery stock free from bacterial spot cankers. Maintain vigorous growing conditions by proper cultivation and fertilization. Resistant varieties: 1) La. Gold-immune, 2) Bicentennial, 3) La. Premiere – very resistant, 4) La. Feliciana, 5) Sure Crop, 6) Majestic, 7) Ruston Red, and 8) Ouachita Gold.
Black Knot (*Dibotryon* sp.)	Symptoms: This disease occurs on plum and cherry. Large, rough, coal black, hard swellings or knots occur along the branches, frequently several inches long. Source of Inoculum: Fungus survives in infected tissue of knots or swellings. Control: Prune and burn diseased branches during the fall or winter, making the cut at least 4" below the visible infection. Destroy badly infected trees. Remove wild plum in the vicinity of desirable trees.
Brown Rot (*Monilinia* sp)	Symptoms: Occurs on both peach and plum. The brown rot fungus causes blossom and twig blight, fruit rot and canker. Affected blossoms turn gray or light brown and are covered with spores if wet weather prevails. Fungus may invade twig from blossom infections, causing twig blight or canker. Fruit infection normally occurs as fruit nears maturity. Small circular light brown spots develop on fruit, often at insect wounds, spots where scab or other diseased spots occur. Spots enlarge rapidly if fruit is mature, often rotting the whole fruit. Spots are sooner or later covered with a brownish-gray colored spore mass. Source of Inoculum: The fungus overwinters in peach "mummies" on the tree or ground in twig cankers. Control: Remove affected peaches from orchard at harvest time. Remove and bury any peach "mummies" remaining on tree before spring. Destroy wild plum thickets, abandoned stone fruit orchards and fence row seedlings as far away as possible from producing trees. Follow recommended spray program beginning at blossom time. (See the Peach and Plum Spray Schedule for materials and timing of spray application.)
Crown Gall (*Agrobacterium* sp.)	Symptoms: Occurs on many fruits including apple, pear, peach and plum. Affects roots and crown of host plant, causing galling of tissue and reduction in the movement of water and nutrients through the plant. Control: Check planting stock for galls or swelling, and rogue infected plants. Treat before planting with galltrol.
Peach Leaf Curl	Symptoms: This disease occurs only on peach trees. It has not been a problem in Louisiana, except on first year trees. Apparently it does not live over the summer here. In spring when leaves first appear they are thickened and as they develop the blade becomes puffed and folded with the edges curling inward, so that the undersurface of the leaf is a series of concave chambers. Affected leaves become reddish or purplish, later becoming reddish-yellow and shedding. Source of Inoculum: Fungus lives from one year to the next on limbs or on the ground.

Fruit Crops
Peaches and Plums

Disease	
Phony Peach (*rickettsia)*	Symptoms: Trees are dwarfed; foliage is abnormally green, fruit small. Phony trees have short terminals and profuse lateral branching. Growth starts in spring earlier than on normal trees. Source of Inoculum: This organism is harbored in infected trees and spread by insect vectors and root grafting. Control: Rogue out and burn all infected trees. Also, destroy wild plum and peach seedlings in the neighborhood of producing trees.
Rhizopus Rot (*Rhizopus* sp.)	Symptoms: Normally an important disease of harvested fruit only. Fruit breaks down quickly into a soft watery rot after harvest and is covered with the "whiskers" or white, raised mold growth with little black spore balls which gives a gross appearance of gray. Source of Inoculum: Spores are omnipresent and airborne. Control: Avoid wounding. Practice sanitation with equipment and around packing shed. Spray with Botran before harvest.
Root Rot (*Clitocybe* sp.)	Symptoms: Tree takes on a weak appearance with small yellowish leaves over the entire tree or confined to one or two branches. The entire tree or single branches may die by the end of the summer or the next year. White mycelial growth can be found beneath bark of roots of affected trees at or about the time of death. Source of Inoculum: Fungus lives in soil. Control: Dig up and burn old roots before planting peach trees. Remove dead trees and as many roots as possible. Fumigate before replanting.
Rust	Symptoms: Rust occurs on both peach and plum trees. Brown pustules occur on the lower leaf surface, marked by a yellowish spot on the upper surface. The disease also attacks the fruit. It may cause to drop prematurely, lowering tree vigor and making it more susceptible to damage.
Scab (*Cladosporium* sp.)	Symptoms: Occurs on both peach and plum, affecting fruit, leaves and twigs. Spots on fruit are small, circular, dark olive-greenish, usually about 1/16 to 1/8 inch in diameter. Spots may be distinctly separate or merge, giving a velvety blotch appearance to one-half or more of the fruit (usually on the attachment end). Spots are superficial. Cracking or distortion of fruit may follow early or severe infection. Source of Inoculum: Fungus lives from year to year in infected twigs. Control: Prune to allow free air circulation. Avoid low-lying planting site. Follow spray schedule.

Commercial Peach Disease Control

Commercial growers should obtain a copy of the 2006 Southeastern Peach, Nectarine, and Plum Pest Management Guide. This publication is available at local county agents offices from the Calhoun Research Station, or accessed on the web through the University of Georgia at www.ent.edu/online_ pubs.htm.

Fruit Crops
Pears

Disease

Disease	
Early Leaf Spot (*Fabrea* sp.)	Symptoms: The disease begins on the lower leaves in early spring. Spots on the leaves mostly circular in outline, dark brown to nearly black, with purplish margins. Spotted leaves turn yellow and shed. Source of Inoculum: The fungus lives mainly in infected leaves on the ground. May also form minute cankers on the bark of twigs and shoots. Control: Rake and burn fallen leaves. Begin sprays in April after leaves have unfolded. Orient has moderate resistance and Maxine is very resistant. Follow Pear Spray Schedule.
Fire Blight (*Erwinia* sp.)	Symptoms: Affects blossoms, leaves, twigs and young fruit. Infected blossoms wilt suddenly and turn dark brown, followed by blighting of leaves and terminals. Infected twigs and leaves turn dark brown to black, and leaves cling to the stem, often remaining attached most of the season. Source of Inoculum: The bacteria overwinters at the base of blighted twigs or in cankers on larger limbs. Bacteria are spread by bees and splashing rains. Control: Spray during blossoming with copper fungicides or streptomycin according to manufacturer's directions. Prune out and burn infected twigs. Cut 12-15 inches below affected tissue. Dip pruning tools in 10% Clorox solution between cuts. Use resistant varieties such as Orient, Moon Glow and Biscamp.
Late Leaf Spot (*Cercospora* sp.)	Symptoms: This disease is first evident about August. The spots are angular to indefinite in outline and brown to grayish. Infected leaves turn yellow and shed. Source of Inoculum: Spread by wind borne spores. Fungus may overwinter on diseased leaves or other hosts. Control: Use labeled fungicides.
Quince Rust (*Gymnosporangium* sp.)	Symptoms: Affects fruit of pear, crabapple, apple, hawthorne and quince. Sometimes affects twigs and buds but seldom leaves. Fruit covered with swellings or pustules which erupt to reveal yellowish to orange powdery spore masses. When each pustule erupts a white fringe develops around eacy spore mass. Source of Inoculum: This fungus must have eastern red cedar, dwarf or prostrate junipers as alternate host to complete its life cycle. Galls are formed on the alternate host in which the fungus survives and infects pears and other plants mentioned. Control: Remove alternate host plants in vicinity of desired trees; or remove all galls from cedar trees during the winter; or follow a regular spray program beginning at blossom and continuing until fruit is formed. A combination of the above measures may be necessary.

Fungicides Labeled for Use on Pears

Disease	Fungicides	Precautions
Fire Blight	Fixed Copper (Kocide DF, LF, 101, 2000) Or Streptomycin Or Mycoshield Alliette	Copper fungicides may cause russeting of fruit. Follow manufacturer's label. Do not apply within 30 days of harvest. See label for phytoxicity warning. 12 hr REI[1] 60 days PHI[2] Follow manufacture's label
Powdery Mildew	Bayleton Or Microthiol Special Or Procure 50S Or Flint Or Sovran Rubigan	Make first application at bud burst. Do not apply within 45 days of harvest. Apply at prebloom and petal fall. May also control spider mites. 14 day PHI 12 hr REI, 14 days PHI 12 hr REI, 30 days PHI 30 day PHI
Fruit Rot (*Glomerella)*	Flint	14 day PHI
Scab	Sovran Or Procure 50WS	12 hr REI, 30 days PHI 14 day PHI. Follow manufacturer's label.
Leaf Spot (*Fabrea)*	Dithane F-45 Dithane M-45	77 day PHI

1. REI – Restricted-entry interval
2. PHI – Preharvest interval

Fruit Crops
Pecans

Disease	
Brown Spot (*Cercospora* sp.)	Symptoms: Early leaf spots are circular, reddish-brown and often develop grayish concentric zones. Spots become irregular later. Nuts are not infected by this fungus. Usually a problem only when trees lack vigor or where rainfall is unusually high. Premature defoliation often occurs when disease is severe. Fungus lives from year to year in infected spots on the old leaves. Spores are windborne. Control: Fertilize trees to improve vigor. Follow Pecan Spray Schedule.
Bunch Disease (*Phytoplasma)*	Symptoms: Affected trees have a bushy growth of slender, willowy shoots. The bunch growths are most conspicuous in spring because they leaf out about two weeks earlier than healthy branches. Control: Never use bud or scion wood from affected trees for propagation. Pruning out diseased branches may help arrest the disease. Destroy severly affected trees.
Downy Spot (*Mycosphaerella* sp.)	Symptom: Appears in late spring or early summer as downy spots on the undersides of the leaflets. Later greenish-white spots about 1/8 inch in diameter are visible on both sides of the leaves. As the season advances, the color of the spots changes to brown. Fungus lives from year to year in infected leaves. Control: Follow Pecan Spray Schedule.
Powdery Mildew (*Microsphaera* sp.)	Symptoms: This disease affects both foliage and nuts, forming a white superficial fungal growth early in the growing season. Lives from year to year on old infected leaves and shucks. Control: Include sulfur in the June, July and August spray at the rate of 6 lbs/100 gals or follow Pecan Spray Schedule.
Leaf Scorch (*Xylella fastidiosa)*	Symptoms: Begins in mid-summer becoming prevalent by late summer. A tan necrosis begins on leaflet tips or margins and advances inward in an irregular pattern toward the center of the leaflet. Infected leaflets turn tan, curl and drop from tree, which may be completely defoliated in some instances. Scorch can be caused by a bacterium (*Xylella fastidiosa).* Other forms of scorch may be caused by other factors such as environmental stresses or nutritional imbalance. Control: Maintaining tree in good nutritional balance and following a good fungicide spray program may give some control.
Rosette (*Zinc nutrional deficiency)*	Symptoms: Nonvisible zinc deficiencies are known to limit yields through reduced flower formation, excessive blossom drop, poor filling and premature defoliation. Visible symptoms include yellowish mottling of leaves, primarily in top branches, with narrow and crinkled leaflets sometimes have perforations between the veins. Severe deficiencies appear as shortened internodes on new growth, some dieback of terminals and a bunching or rosetting effect. No pathogen involved. Control: Leaf zinc levels should be determined by foliar analysis. Several sprays of 2 – 3 lbs. 36% zinc sulfate or 2 to 4 qts. NZN should be applied to correct deficiencies indicated by the analysis. In acid soils, dry zinc sulfate salts may be applied to the soil at .25 to .50 lb per inch trunk diameter. Use the smaller amounts on sandy soils. In alkaline soils, application of zinc salts to the soil is not effective. Adequate leaf zinc levels must be maintained by foliar or soil applications as determined by annual foliar analysis.

Fruit Crops
Pecans

Disease	
Scab (*Cladosporium* sp.)	Symptoms: Early leaf infections produce pinpoint olive brown lesions often on veins of undersides of leaves. Spots enlarge and coalesce until large areas of leaves may become almost black. Lesions on nuts are small, black and circular, slightly raised at first but later sunken. The entire surface of nuts of highly susceptible varieties may appear black from extensive infections. Fungus may overwinter in old infested shucks, leaf stems or leaves. The fungus is spread by windborne spores and is favored by high humidity. Control: Knock off old shucks and stems before spring. Prune out low limbs to improve air circulation in orchard. Follow Pecan Spray Schedule.
Vein Spot (*Gnomonia* sp.)	Symptoms: Spots may orginate on vein of leaflets or on leaf stem and are dark brown to black in final stages. On lateral veins, lesions are circular or oval and seldom attain a diameter of more than ¼ inch. On midribs of leaflets and on leaf stems, spots are long and narrow. When the disease is severe, premature defoliation usually occurs. Fungus lives through the winter on fallen leaves. Control: The prepollination spray and first cover sprays are essential for control.

Louisiana Recommendations for Control of Pecan Diseases

Control of diseases and insects is essential for profitable pecan production in Louisiana. Commercial pecan producers must spray at the proper time with recommended fungicides and insecticides. Learning to identify the major insect pests and diseases of pecans is highly desirable and strongly recommended. To obtain adequate disease control and receive maximum benefit from applied fungicides, spray applications must be made on a preventive program.

In addition to spraying, cultural practices and sanitation can reduce the severity of certain insects and disease problems. The practices should be followed by both commercial growers and homeowners with only a few trees.

Sanitation: Certain leaf diseases, such as scab, and insects, such as the hickory shuckworm, overwinter on shucks and leaves. If these are raked and burned, it will help reduce the severity of these problems to some extent the following year. Prune dead and broken limbs from trees to remove potential habitats for certain insects and diseases.

Fertilization: Proper fertilization will increase production and favor pest control. Well maintained pecan trees are less susceptible to attack by certain diseases and insects. Consult the Louisiana Cooperative Extensive Service for information on leaf and soil sampling techniques, fertilization and cultural practices.

Spray Equipment: Good spray coverage is essential for good disease control and, to a lesser extent, for insect control. A large air blast sprayer (speed sprayer) has proved very satisfactory for treating large acreages of pecan trees for control of insects and diseases.

Spray Schedule for Control of Pecan Diseases

Caution

The potential for developing resistant strains of pathogens to fungicides is very great in pecan production. To avoid this:

1. Alternate fungicides in the spray program.
2. Do not use several consecutive sprays with one fungicide or similar fungicides.
3. Avoid using higher rates of fungicides than those recommended. Proper calibration is essential.

Spray Schedule for Control of Pecan Diseases

Spray and time of Application	Disease to be Controlled	Spray Material*	Amount/ Acre	Remarks
First prepollination Spray when leaves are 1 inch in length	Scab Vein Spot Downy Spot	Supertin 80WP Enable 2F Orbit 3.6E Syllit 65WP Agri Tin 80WP Abound 2.08F Sovran 50WG Stratego	7.5 ozs 8 fl ozs 6-8 fl ozs 2 lbs 7.5 ozs 9.5-10 fl ozs 3.2 ozs 10 fl. ozs	Do NOT graze sprayed orchards. Enable requires a wetting agent. Syllit may cause leaf burn on Moore & Van Deman cultivars.
Second Prepollination spray when leaves are half grown. (10 days– 2 weeks after first spray)	Scab Vein Spot Downy Spot	Supertin 80WP Enable 2F Orbit 3.6E Syllit 65WP Abound 2.08F Sovran 50WG Agri Tin 80WP Stratego	7.5 ozs 8 fl ozs 6-8 fl ozs 2 lbs 9.5-10 fl ozs 3.2 ozs 7.5 ozs 10 fl ozs	Same as above. Follow manufacturer's label.
	Zinc Maintenance	36% Zinc Sulfate	15 lbs	
First cover spray, 2 – 3 weeks after last spray, often in early May.	Scab Vein Spot Downy Spot	Supertin 80WP Enable 2F Orbit 3.6E Syllit 65WP Abound 2.08F Sovran 50WG Agri Tin 80WP Stratego	7.5 ozs 8 fl ozs 6-8 fl ozs 2 lbs 9.5-11 fl ozs 3.2 ozs 7.5 ozs 10 fl ozs	Same as above. Follow manufacturer's label.
	Zinc Maintenance	36% Zinc Sulfate	15 lbs	
Second cover spray, 2 – 3 weeks after last application.	Scab	Supertin 80WP Enable 2F Orbit 3.6E Syllit 65WP Abound 2.08F Sovran 50WG Agri Tin 80WP	7.5 ozs 8 fl ozs 6-8 fl ozs 2 lbs 9.5-11 fl ozs 3.2 ozs 7.5 ozs	
Same as above. Follow manufacturer's label. Third cover spray, 2 – 4 weeks after last spray	Scab	Supertin 80WP Enable 2F Orbit 3.6E Syllit 65WP Abound 2.08F Sovran 50WG Agri Tin 80WP	7.5 ozs 8 fl ozs 6-8 fl ozs 2 lbs 9.5-11 fl ozs 3.2 ozs 7.5 ozs	Do NOT graze sprayed orchards. Enable requires a wetting agent. Syllit may cause leaf burn on Moore & Van Deman cultivars.

Spray Schedule for Control of Pecan Diseases

Spray and time of Application	Disease to be Controlled	Spray Material*	Amount/ Acre	Remarks
Fourth cover spray, 2 – 3 weeks after last spray.	Scab	Supertin 80WP	7.5 ozs	Same as above. Follow manufacturer's label.
		Enable 2F	8 fl ozs	
		Orbit 3.6E	6-8 fl ozs	
		Syllit 65WP	2 lbs	
		Abound 2.08F	9.5-11 fl ozs	
		Sovran 50WG	3.2 ozs	
		Agri Tin 80WP	7.5 ozs	
		Stratego	10 fl ozs	
Fifth cover spray, 3 – 4 weeks after spray.	Scab	Supertin 80WP	7.5 ozs	The last 2 sprays can be omitted if weather is dry.
		Enable 2F	8 fl ozs	
		Orbit 3.6E	6-8 fl ozs	
		Syllit 65WP	2 lbs	
		Abound 2.08F	9.5-11 fl ozs	
		Sovran 50WG	3.2 ozs	
		Agri Tin 80WP	7.5 ozs	
		Stratego	10 fl ozs	
Sixth cover spray	Scab	Supertin 80WP	7.5 ozs	Do not apply fungicides after shuck split
		Enable 2F	8 fl ozs	
		Orbit 3.6E	6-8 fl ozs	
		Syllit 65WP	2 lbs	
		Abound 2.08F	9.5-11 fl ozs	
		Sovran 50WG	3.2 ozs	
		Agri Tin 80WP	7.5 ozs	
		Stratego	10 fl ozs	

***It is necessary that fungicides be alternated in order to prevent resistance from occurring. Do Not Alternate Fungicides with the same mode of Action.**

Airplane Applications for Control of Pecan Scab and Brown Leaf Spot

Past research has shown the black pecan aphid, spider mites, pecan nut casebearer, phylloxera, and pecan scab have been controlled to some degree with pesticides applied by airplane. Control by ground equipment is considered more effective and is the method of choice. When ground equipment is not available, or when inclement weater prevents its use, airplane applications may be substituted.

Schedule	Diseases to Control	Fungicides	Amount Per Acre*
Begin with prepollination spray. Subsequent sprays depend on weather. Four-six applications at about three week intervals may be necessary during growing season.	Pecan Scab Down Spot Spots on leaves and nuts and premature defoliation.	Supertin 80W Enable 2F + Adjuvant Orbit 3.6E Abound 2.08F Sovran 50WG Agri Tin 80 WP	7.5 ozs 8 fl ozs 6-8 fl ozs 9.5 – 11 fl ozs 3.2 ozs 7.5 ozs
*Apply in 20 gallons of spray material per acre. Do NOT graze sprayed orchards.			

Fungicides for Use in Strawberry Production

Anthracnose, Crown Rot (*Colletotrichum* sp.)	Symptoms: Plants wilt suddenly and die during warm weather. Crowns have a reddish discoloration extending into the center. Black lesions occur on leaf petioles or runners. Disease development is inhibited by cool weather. Source of Inoculum: The fungus lives through the winter on infected plant parts. Control: Obtain plants grown in areas where the disease is not present. Set the earliest runner plants and remove them to plant beds (nursery) as soon as they have sufficient roots to be removed from the mother plant. Destroy the winter stools as soon as sufficient plants are obtained.
Gray Mold (*Botrytis* sp.)	Symptoms: This fungus may attack flowers, flower parts, fruit and leaf parts. On the fruit it causes a rot which is at first light brown and soft (not "leaky"). As the berry rots it becomes covered with a grayish, powdery growth and in the final stages of rot becomes tough and firm in texture. Source of Inoculum: The fungus survives in decaying plant tissue of strawberries and many other plants. Control: Control leaf diseases and remove dead leaves, which can furnish a site for the fungus to develop. Spray with Captan, Elevate, Pristine or Switch.
Leaf Blight (*Dendrophoma* sp.)	Symptoms: The first appearance of infection is large spots which are circular and reddish-purple, become zonated with age. The spots have a dark brown center surrounded by a lighter brown area with a purplish border. Mature spots may be circular, oval or V-shaped. Source of Inoculum: The fungus lives from year to year primarily on infected plant tissue. Control: Plant disease-free plants. Follow spray schedule for leaf spot.
Leaf Scorch (*Diplocarpon* sp.)	Symptoms: The first appearance of leaf scorch occurs on the upper leaf surfaces as small purplish discolorations which rapidly enlarge into irregular purplish blotches from 1/16 to 3/16 inch in diameter. The spots may become numerous and coalesce. In severe cases the edges of the leaflets curl upward and the tissue dies, giving the plant a scorched appearance. Source of Inoculum: The fungus survives from year to year on infected leaves. Control: Plant disease-free plants. Rotate strawberry fields, if possible. Follow spray program for leaf spot.
Leaf Spot (*Mycosphaerella* sp.)	Symptoms: The spots are at first less that 1/8 inch in diameter and purplish-red. Spots enlarge to about 3/16 inch. They have white or gray centers with purplish borders. Source of Inoculum: The fungus lives through winter on infected plant parts.
Powdery Mildew (*Sphaerotheca* sp.)	Symptoms: Affected plants show a white powdery growth on the surface of the leaves and fruit. The leaves that become infected have a tendency to roll up. Source of Inoculum: The fungus persists from year to year on the strawberry and various wild hosts. Usually a problem in the spring and early summer months.

Root Knot Nematodes (*Meloidogyne hapla)*	Symptoms: Affected plants are stunted, unthrifty, unproductive and often pale green. Galls or knots on the roots are rather small. Numerous secondary roots may develop at the small swellings. Frequently, blackened rotted roots are associated with root knot problems. Source of Inoculum: Root knot nematodes live from year to year in the soil and on the roots of strawberry plants and may weed plants. Root knot is more severe in light soil types. Control: Fumigate plant bed soil and field soil. See table on Nematode Control in Fruit Crops.
Summer Dwarf or Bud Nematode (*Aphenlenchoides* sp.)	Symptoms: Affected plants are severely stunted during the summer and early fall. Older leaflets are usually darker green with a greasy appearance. Young leaflets are reduced in size, usually crinkled, somewhat elongated with shorter petioles. Margins of leaflets may curl upward in the young leaflets and downward in the older leaflets. Source of Inoculum: Bud nematodes live from year to year on infected daughter plants and in the soil, Control: Fumigate fields where the disease has occurred, and oobtain disease-free plants. No satisfactory irradicant treatment for infected plants can be recommended.

Fungicides for Use in Strawberry Production

Target Disease (Pathogen)	Common Name	Trade Name(s)	Efficacy[x]	Resistance Risk[y]	Comments
Angular Leaf Spot (*Xanthomonas fragariae*)	copper oxychloride	Champion, Kocide	++	low	pH: 6.5 to 9.0
Anthracnose (*Colletotrichum* spp.)	azoxystrobin	Abound, Quadris	++	**HIGH**	
	boscalid + pyraclostrobin	Pristine	++		
	captan + fenhexamid	Captevate	++		
	iprodione	Rovral	+	**medium to high**	pH: 5.0 to 7.0
	potassium bicarbonate	Armicarb 100, MilStop	?	low	pH: no less than 7.0, 8.0
	pyraclostrobin	Cabrio	++	**HIGH**	
Gray Mold (*Botrytis cinerea*)	azoxystrobin	Abound, Quadris	+	**HIGH**	
	boscalid + pyraclostrobin	Pristine	++		
	captan	Captan	+	low	
	captan + fenhexamid	Captevate	?		
	cyprodinil + fludioxonil	Switch	++		
	fenhexamid	Elevate	+++	**low to medium**	
	iprodione	Rovral	+++	**medium to high**	pH: 5.0 to 7.0
	potassium bicarbonate	Armicarb 100, MilStop	?	low	pH: no less than 7.0, 8.0
	pyraclostrobin	Cabrio	+	**HIGH**	
	pyramethanil	Scala	?	**medium**	
	thiophanate-methyl	Thiophanate-methyl, Topsin M	+	**HIGH**	
Leaf Blight (*Phomopsis obscurans = Dendrophoma obscurans*)	See: Leaf Spot				
Leaf Blotch (*Gnomonia* spp.)	See; Leaf Spot				
Leaf Scorch (*Diplocarpon earlianum*)	See: Leaf Spot				
Leaf Spot (*Mycosphaerella fragariae = Ramularia brunnea*)	basic copper sulfate	Basic Copper 53, Cuprofix Disperss	++	low	pH: no less than 6.5
	boscalid + pyraclostrobin	Pristine	++		
	captan	Captan	+	low	
	copper hydroxide	Champ, Champion, Kocide, Nu-Cop, Stretch	++	low	pH: 6.5 to 9.0
	copper oxychloride	COC	++	low	pH: 6.5 to 9.0
	cuprous oxide	Nordox	++	low	pH: no less than 6.5
	dodine	Syllit	?	**low**	

Fungicides for Use in Strawberry Production

Target Disease (Pathogen)	Common Name	Trade Name(s)	Efficacy[x]	Resistance Risk[y]	Comments
Leaf Spot (*Mycosphaerella fragariae* = *Ramularia brunnea*) (cont.)	iprodione	Rovral	++	**medium to high**	pH: 5.0 to 7.0
	myclobutanil	Nova	++	**medium**	
	pyraclostrobin	Cabrio	++	**HIGH**	
	thiophanate-methyl	Thiophanate-methyl, Topsin M	++	**HIGH**	
Powdery Mildew (*Sphaerotheca macularis* f. sp. *fragariae)*	azoxystrobin	Abound, Quadris	+	**HIGH**	
	boscalid + pyraclostrobin	Pristine	++		
	copper hydroxide	Champ, Champion, Kocide, Nu-Cop, Stretch	+	low	pH: 6.5 to 9.0
	myclobutanil	Nova	++	**medium**	
	potassium bicarbonate	Armicarb 100, MilStop		low	pH: no less than 7.0, 8.0
	pyraclostrobin	Cabrio	++	**HIGH**	
	sulfur	Dusting Sulfur, Liquid Sulfur Six, Microthiol Disperss, Super-Six, Thiosperse 80%, Wettable Sulfur	++	low	
	thiophanate-methyl	Thiophanate-methyl, Topsin M	++	**HIGH**	
	triflumazole	Procure	+++	**medium**	

[x] **+ = poor to fair; ++ = fair to good; +++ = good to excellent; ? = not known**

[y]**Resistance management must be practiced for those fungicides whose risk factor is in bold.**

Fungicide Spray Program for Strawberries

Time of Application	Disease to be Controlled	Spray Material*	Amount/ 100 gals	Remarks
November 15 – Bloom	Leaf Spot and other foliar diseases	Topsin-M + Captan OR	.5 lb + 2 lbs	Alternate foliar sprays.
		Rovral OR	1.5 – 2 pts	Do not apply Rovral more than 4 times per season.
		Fixed Copper	Mfg. label	
		OR Syllit 65W	1.5 – 2 lbs	Do not apply Syllit within 14 days of harvest.
		OR Nova 40W	2.5 – 5 lbs	14 to 21 day interval.
	Bacterial Leaf Spot	Fixed Copper	Mfg. label	Alternate with other fungicides.
Bloom - Harvest	Powdery Mildew	Topsin-M OR	.5 lb	Alternate Topsin M with sulfur to avoid disease resistance from occurring.
		Sulfur OR	Mfg. label	Use wettable sulfur. Do not apply sulfur when temperature is above 85°F.
		Nova 40W OR	2.5 – 5 ozs	
		Cabrio	14 ozs	1day PHI
		Procure	4-8 oz/A	
	Leaf Spot Leaf Scorch Leaf Blight	Syllit 65W OR	1.5 – 2 lbs	Do not use Syllit within 14 days of harvest.
		Nova 40W OR	2.5 – 5 ozs	
		Cabrio	14 oz/A	
	Red Stele Phytophthora Crown Rot	Aliette OR	2.5 – 3.5 lbs/A	Foliar spray. 14 days after Planting.
		Ridomil 2E	2 qts/A	Apply in sufficient water to move product into the root zone.
	Fruit Rot Gray Mold Anthracnose Leaf Spot	Topsin-M + Captan	.5 lb + 2 lbs	Alternate combination Sprays. Spray at 7 to 14 day intervals.
		OR	1.5 lbs + 2 lbs	
		Quadris OR	10 ozs/100 gals	For Anthracnose only.
		Elevate Plus Captan OR	1.5 lbs/A plus 2 lbs	Elevate for gray mold.
		Switch OR	14 ozs/A	
		Cabrio	14 ozs/A	

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Abelia	leaf spot (*Cercospora*)	myclobutanil thiophanate-methyl
	powdery mildew (*Oidium*)	myclobutanil thiophanate-methyl
African Violet (*Saintpaulia*)	blight (*Botrytis*)	mancozeb thiophanate-methyl vinclozolin
	powdery mildew (*Oidium*)	myclobutanil triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
Ageratum	leaf spot (*Cercospora*)	iprodione potassium bicarbonate thiophanate-methyl triadimefon
	powdery mildew (*Erysiphe*)	potassium bicarbonate thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon
	stem rot (*Rhizoctonia*)	iprodione

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Aglaonema	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
Ajuga	leaf spot (*Cercospora, Colletotrichum*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Corynespora*)	copper sulfate potassium bicarbonate thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	root and stem rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Algerian Ivy	root rot (*Phytophthora, Pythium*)	mefenoxam
Almond, flowering	blight (*Monilinia*)	chlorothalonil myclobutanil
	blossom blight (*Botrytis*)	iprodione mancozeb potassium bicarbonate thiophanate-methyl
Alyssum	damping off (*Rhizoctonia*)	thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole propamocarb hydrochloride
American hornbeam	powdery mildew (*Microsphaera, Phyllactinia*)	triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Anthurium	anthracnose (*Gloeosporium*)	mancozeb thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole metalazyl
Aphelandra	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl/mancozeb
	root rot (*Phytopthora, Pythium*)	aluminum tris mefenoxam
	root rot (*Rhizoctonia*)	iprodione
Arborvitae	blight (*Pestalotia*)	lime & copper sulfate mancozeb
	blight (*Phomopsis*)	lime and copper sulfate mancozeb thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole mefenoxam
Arctostaphylos	root rot (*Phytophthora, Pythium*)	etridiazole
Ardisia	leaf spot (*Cercospora*)	thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia, Sclerotinia*)	thiophanate-methyl
Areca palm	root rot (*Phytophthora, Pythium*)	etridiazole
Artemisia	root rot (*Phytophthora, Pythium*)	mefenoxam
Ash	anthracnose (*Gloeosporium*)	thiophanate-methyl/mancozeb
	leaf spot (*Cercospora*)	chlorothalonil

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Ash (cont'd.)	leaf spot (*Cercospora*)	mancozeb thiophanate-methyl
	leaf spot (*Cercosporidium, Cylindrosporium*)	chlorothalonil mancozeb
	powdery mildew (*Oidium*)	triadimefon thiophanate-methyl
	rust (*Puccinia*)	copper sulfate myclobutanil
Asparagus fern	anthracnose (*Colletotichum*)	captan
	blight (*Ascochyta, Cercospora*)	thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	
Aspidistra (barroom plant)	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Ascochyta, Cercospora*)	thiophanate-methyl
Aster	powdery mildew (*Erysiphe*)	potassium bicarbonate sulfur thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophante methyl thiophanate-methyl
	Rust (*Puccinia*)	azoxystrobin mancozeb maneb myclobutanil sulfur

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Aster (cont'd.)		triadimefon triforine
	stem rot (*Rhizoctonia*)	iprodione maneb thiophanate-methyl
Astilbe	leaf spot (*Cercospora*)	chlorothalonil
	powdery mildew (*Erysiphe*)	thiophanate-methyl
Aucuba	anthracnose (*Gloeosporium*)	mancozeb thiophanate-methyl
	leaf spot (*Pestalotia, Phyllosticta*)	copper sulfate
	root rot (*Fusarium, Phytophthora, Pythium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia, Fusarium*)	azoxystrobin
Acuba japonica (only)	root rot (*Phytophthora, Pythium*)	mefenoxam
Azalea	damping off (*Rhizoctonia*)	captan thiophanate-methyl
	dieback (*Phytophthora*)	chlorothalonil lime & copper sulfate
	flower blight (*Ovulinia*)	captan chlorothalonil mancozeb maneb myclobutanl PCNB potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb triforine vinclozolin

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Azalea (cont'd.)		zineb
	leaf gall (*Exobasidium*)	triadimefon tribasic copper sulfate
	leaf spot (*Cercospora, Colletotrichum*)	mancozeb potassium bicarbonate thiophanate-methyl/mancozeb
	leaf spot (*Phyllosticta*)	copper sulfate chlorothalonil
	powdery mildew (*Microsphaera*)	azoxystrobin copper hydroxide copper oleate myclobutanil potassium bicarbonate sulfur thiophanate-methyl triadimefon triforine
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	azoxystrobin eridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	web blight (*Rhizoctonia*)	iprodione
Baby's breath (*Gypsophila*)	gray mold (*Botrytis*)	mancozeb potassium bicarbonate thiophanate-methyl
	leaf spot (*Phyllosticta*)	mancozeb
	root rot (*Phytophthora, Pythium*)	mefenoxam

Plant	Disease	Common Chemical [1,2,3]
Baby's breath (cont.)	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Balsam (*Impatiens balsamina*)	leaf spot (*Cercospora, Septoria*)	potassium bicarbonate thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia* *Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Banaba shrub	algal leaf spot (*Cephaleuros*)	copper sulfate
Barberry	bacterial leaf spot (*Pseudomonas*)	lime & copper sulfate
	leaf spot (*Gloeosporium*)	chlorothalonil
	powdery mildew (*Erysiphe, Phyllactinia*)	azoxystrobin myclobutanil thiophanate-methyl triadimefon
	rust (*Cumminsiella, Puccinia*)	azoxystrobin myclobutanil triadimefon
Bay, red	leaf spot (*Cercospora*)	thiophanate-methyl
Bee balm	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl
Beech, American	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Phyllactinia*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Begonia	anthracnose (*Colletotrichum*)	mancozeb
	bacterial leaf spot (*Xanthomonas*)	copper hydroxide
	gray mold (*Botrytis*)	chlorothalonil mancozeb thiophanate-methyl vinclozolin
	leaf spot (*Cercospora, Phomopsis*)	mancozeb thiophanate-methyl/mancozeb
	leaf spot (*Phyllosticta*)	chlorothalonil copper sulfate
	powdery mildew (*Erysiphe*)	copper oleate myclobutanil thiophanate-methyl triadmefon triforine
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	mancozeb
Birch	anthracnose (*Gloeosporium*)	mancozeb thiophanate-methyl
	leaf spot (*Septoria*)	mancozeb thiophanate-methyl
	powdery mildew (*Phyllactinia*)	thiophanate-methyl triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Black cherry	anthracnose (*Colletotrichum*)	potassium bicarbonate thiophanate-methyl
	leaf blister (*Taphrina*)	copper sulfate
	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl
	powdery mildew (*Podosphaera*)	potassium bicarbonate thiophanate-methyl
	rust (*Tranzschelia*)	copper sulfate
Bleeding heart	leaf spot (*Cercospora, Colletotrichum*)	thiophanate-methyl
Boston Fern	rust (*Desmella*)	triadimefon
	web blight (*Rhizoctonia*)	thiophanate-methyl
Bottlebrush	gall (*Nectriella*)	Prune out gall
Bougainvillea	root rot (*Phytophthora, Pythium*)	aluminum tris
Box elder	anthracnose (*Gleoesporium*)	thiophanate-methyl
	leaf spot (*Ascochyta,Cercospora, Septoria*)	thiophanate-methyl
	powdery mildew (*Microsphaera, Uncinula*)	thiophanate-methyl
Boxwood	canker (*Nectria*)	calcium polysulfide lime & copper sulfate
	leaf spot (*Macrophoma, Phyllosticta*)	copper sulfate mancozeb
	root rot (*Phytophthora,*	aluminum tris etridiazole

Plant	Disease	Common Chemical [1,2,3]
Boxwood (cont'd.)	*Pythium*)	etridiazole/thiophante methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Browallia	root rot (*Phytophthora, Pythium*)	propamocarb hydrochloride
Buckeye	anthracnose (*Glomerella*)	thiophanate-methyl
	leaf blotch (*Phyllosticta*)	chlorothalonil copper sulfate mancozeb
	leaf spot (*Cercospora*)	chlorothalonil mancozeb thiophanate-methyl
	powdery mildew (*Uncinula*)	benomyl myclobutanil triadimefon
Buckthorn	leaf spot (*Cercospora, Septoria*)	chlorothalonil
	rust (*Puccinia*)	triadimefon
Buffaloberry	leaf spot (*Cylindrosporium*)	mancozeb
Cactus	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
Caladium	root rot (*Fusarium, Rhizoctonia Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Caladium (cont.)	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
Calathea	root rot (*Phytophthora, Pythium*)	etridiazole
Calceolaria	root rot (*Pythium*)	etridiazole
Calendula	powdery mildew (*Erysiphe*)	potassium bicarbonate propamocarb hydrochloride sulfur thiophanate-methyl triadimefon triforine
	leaf spot (*Cercospora*)	myclobutanil potassium bicarbonate sulfur thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
	rust (*Puccinia*)	triadimefon
	stem rot (*Rhizoctonia*)	iprodione PCNB thiophanate-methyl
	stem rot (*Sclerotinia*)	PCNB thiophanate-methyl
Camellia	flower blight (*Ciborinia*)	captan mancozeb maneb PCNB thiophanate-methyl/mancozeb triadimefon vinclozolin
	leaf spot (*Cephaleuros, Pestalotia*)	copper oleate copper sulfate

Plant	Disease	Common Chemical [1,2,3]
Camellia (cont'd.)	petal blight (*Botrytis*)	captan mancozeb PCNB thiophanate-methyl zineb
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
Camphor-tree	anthracnose (*Glomerella*)	thiophanate-methyl
	leaf spot (*Gloeosporium*)	chlorothalonil
	powdery mildew (*Microsphaera*)	thiophanate-methyl
Candytuft	gray mold (*Botrytis*)	thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Canna	rust (*Puccinia*)	triadimefon
Carissa	root rot (*Phytophthora, Pythium*)	etridiazole
Carnation	anthracnose (*Colletotrichum*)	mancozeb maneb potassium bicarbonate thiophanate-methyl
	branch rot (*Botrytis*)	chlorothalonil copper hydroxide iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl vinclozolin

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Carnation (cont'd.)		zineb
	damping off (*Pythium*)	captan thiophanate-methyl
	leaf spot (*Alternaria*)	captan chlorotalonil copper hydroxide iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl/mancozeb zineb
	leaf spot (*Septoria*)	chlorothalonil mancozeb Potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Oidium*)	myclobutanil potassium bicarbonate sulfur thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodone PCNB thiophanate-methyl
	rust (*Uromyces*)	captan mancozeb myclobutanil sulfur triadimefon triforine zineb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Catalpa	anthracnose (*Gloeosporium*)	thiophanate-methyl
	leaf spot (*Cercospora*)	myclobutanil thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Microsphaera, Phyllactinia*)	myclobutanil sulfur thiophanate-methyl
Cattleya skinneri	root rot (*Phytophthora, Pythium*)	aluminum tris
Cedar	leaf spot (*Alternaria*)	sulfur
	needle blight (*Cercospora, Phomopsis*)	azoxystrobin thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
Celosia	leaf spot (*Alternaria*)	thiophanate-methyl/mancozeb
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl propamocarb hydrochloride thiophanate-methyl
Ceanothus	root rot (*Phytophthora, Pythium*)	etridiazole
Chamaedorea	root rot (*Phytophthora, Pythium*)	etridiazole

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Cherry-hawthorn	leaf spot (*Fabraea*)	chlorothalonil
	rust (*Gymnosporangium*)	chlorothalonil
Cherry-laurel	leaf spot (*Cercospora*)	chlorothalonil potassium bicarbonate sulfur thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Septoria*)	chlorothalonil potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Podosphaera*)	potassium bicarbonate sulfur thiophanate-methyl
Chestnut	powdery mildew (*Microsphaera, Phyllactinia*)	thiophanate-methyl triadimefon
Chinaberry	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Phyllactinia*)	thiophanate-methyl
Chinese elm	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Actinopelte, Phyllosticta*)	copper sulfate
	powdery mildew (*Phyllactinia*)	thiophanate-methyl
Chinese evergreen	root rot (*Phytophthora, Pythium*)	etridiazole
Chinese forget-me-not	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora*)	chlorothalonil

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Chinese-forget-me-not (cont.)	stem rot (*Rhizoctonia*)	thiophanate-methyl
Chinese lantern	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
Chinese parasol tree	web blight (*Rhizoctonia*)	copper sulfate thiophanate-methyl
Chinese pistachio	leaf spot (*Septoria*)	thiophanate-methyl
	thread blight (*Rhizoctonia*)	copper sulfate thiophanate-methyl
Chocolate plant	leaf spot (*Phyllosticta*)	copper sulfate
Christmas rose	flower spot (*Botrytis*)	thiophanate-methyl
Chrysanthemum	anthracnose (*Colletotrichum*)	mancozeb potassium bicarbonate thiophanate-methyl/mancozeb zineb
	bacterial blight (*Pectobacterium*)	streptomycin
	damping off (*Pythium*)	captan
	gray mold (*Botrytis*)	captan chlorothalonil copper hydroxide dichloran iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl vinclozolin zineb

Plant	Disease	Common Chemical [1,2,3]
Chrysanthemum (cont'd.)	leaf spot (*Septoria*)	chlorothalonil copper hydroxide copper oleate lime & copper sulfate mancozeb maneb potassium bicarbonate sulfur thiophanate-methyl thiophanate-methyl/mancozeb zineb
	powdery mildew (*Erysiphe*)	copper oleate potassium bicarbonate sulfur thiophanate-methyl triadimefon
	ray blight (*Ascochyta*)	chlorothalonil copper oleate lime & copper sulfate mancozeb maneb potassium bicarbonate propiconazole thiophanate-methyl/mancozeb zineb
	ray blight (*Mycosphaerella*)	mancozeb potassium bicarbonate
	root rot (*Phytophthora, Pythium*)	etridiazole mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	iprodione PCNB thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon zineb
Cineraria	powdery mildew (*Erysiphe*)	potassium bicarbonate thiophanate-methyl triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Cineraria (cont.)	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
	root and stem rot (*Phytophthora, Pythium*)	etridiazole
Cissus	leaf spot (*Cercospora*)	thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	aluminum tris
Clarkia	gray mold (*Botrytis*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	thiophanate-methyl
Clematis	leaf spot (*Ascochyta, Cercospora*)	sulfur thiophanate-methyl
Cleyera	leaf spot (*Cercospora*)	thiophanate-methyl
Cockscomb	leaf spot (*Cercospora*)	thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Coleus	leaf blight (*Botrytis*)	potassium bicarbonate thiophanate-methyl vinclozolin
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Columbine	leaf spot (*Ascochyta, Septoria*)	potassium bicarbonate sulfur thiophanate-methyl
	powdery midew (*Erysiphe*)	potassium bicarbonate thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	mefenoxam
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
	rust (*Puccinia*)	copper sulfate myclobutanil
Coneflower	leaf spot (*Cercospora*)	thiophanate-methyl
Confederate jasmine	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Corynespora*)	copper sulfate thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Cordyline	leaf spot (*Cercospora*)	thiophanate-methyl
Coreopsis	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	chlorothalonil
	leaf spot (*Phyllosticta*)	copper sulfate
	rust (*Coleosporium*)	copper sulfate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Coreopsis (cont.)	stem rot (*Rhizoctonia*)	thiophanate-methyl
Cornflower	leaf spot (*Cercospora, Septoria*)	chlorothalonil
	rust (*Puccinia*)	copper sulfate
	stem rot (*Rhizoctonia, Sclerotinia*)	thiophanate-methyl
Cosmos	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	myclobutanil sulfur thiophanate-methyl
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Cotoneaster	leaf spot (*Cercospora*)	mancozeb thiophanate-methyl
	leaf spot (*Phyllosticta*)	mancozeb
	root rot (*Phytophthora, Pythium*)	mefenoxam
Cottonwood	leaf blister (*Taphrina*)	copper sulfate
	leaf spot (*Cercospora, Septoria*)	chlorothalonil
	powdery mildew (*Uncinula*)	triadimefon
	rust (*Melampsora*)	triadimefon
Crabapple	leaf spot (*Sphaeropsis*)	chlorothalonil mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Crabapple (cont.)	powdery mildew (*Podosphaera*)	myclobutanil propiocnazole thiophanate-methyl thiophanate-methyl/mancozeb triadimefon
	rust (*Gymnosporangium*)	chlorothalonil mancozeb myclobutanil propiconazole thiophanate-methyl/mancozeb triadimefon
	scab (*Venturia*)	chlorothalonil mancozeb myclobutanil propiconazole thiophanate-methyl/mancozeb
Crape myrtle	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Pestalotia, Phyllosticta*)	copper oleate mancozeb
	powdery mildew (*Erysiphe, Phyllactinia*)	azoxystrobin copper oleate myclobutanil propiconazole sulfur thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl
Crassula	leaf spot (*Cercospora, Phomopsis*)	potassium bicarbonate thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Crassula (cont.)	powdery mildew (*Spaerotheca*)	potassium bicarbonate thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole
Croton	root rot (*Fusarium, Phytophthora Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
Crown vetch	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
Cypress	blight (*Cercospora*)	lime & sulfur sulfate mancozeb thipphanate methyl
	blight (*Phomopsis*)	azoxystrobin
Daffodil	bulb rot (*Fusarium, Penicillium*)	thiophanate-methyl
	leaf scorch (*Stagnospora*)	chlorothalonil iprodione
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Dahlia	blight (*Botrytis*)	copper oleate iprodionelime & copper sulfate mancozeb maneb thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Cercospora*)	copper oleate iprodione lime & copper sulfate mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Dahlia (cont.)		maneb thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Erysiphe*)	copper oleate myclobutanil sulfur thiophanate-methyl triadimefon triforine
	root rot (*Phytophthora,* *Pythium*)	etridiazole etridiazole/thiopanate methyl propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Daisy	gray mold (*Botrytis*)	chlorothalonil mancozeb thiophanate-methyl
	leaf spot (*Cercospora*)	chlorothalonil mancozeb thiophanate-methyl
	leaf spot (*Phyllosticta*)	chlorothalonil copper sulfate
	leaf spot (*Septoria*)	chlorothalonil mancozeb thiophanate-methyl
	powdery mildew (*Erysiphe*)	azoxystrobin sulfur thiophanate-methyl triadimefon
	ray blight (*Mycosphaerella*)	chlorothalonil mancozeb
	rust (*Puccinia*)	mancozeb triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Daisy (cont'd)	stem rot *(Fusaruim, Rhizoctonia Sclerotinia)*	thiophanate-methyl
Daphne	leaf spot (*Gloeosporium*)	
	root rot (*Phytophthora, Pythium*)	etridiazole
	stem rot (*Sclerotinia*)	thiophanate-methyl
Daylily	anthracnose (*Colletotrichum*)	thiophanate-methyl
	blight (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora, Phomopsis*)	thiophanate-methyl
Daylily	root and stem rot *(Fusarium, Rhizoctonia)*	thiophanate-methyl
Delphinium	gray mold (*Botrytis*)	iprodione potassium bicarbonate thiophanate-methyl viclozolin
	leaf spot (*Ascochyta, Cercospora*)	copper oleate potassium bicarbonate
	leaf spot (*Phyllosticta*)	copper oleate
	powdery mildew (*Erysiphe*)	copper oleate myclobutanil Potassium bicarbonate propiconazole sulfur thiophanate-methyl triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Delphinium (cont'd)	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl
	rust (*Puccinia*)	copper sulfate mycloutanil
	stem rot (*Rhizocotonia, Sclerotinia*)	thiophanate-methyl
Deutzia	leaf spot (*Cercospora*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Dianthus	root rot (*Phytophthora, Pythium*)	iprodione etridiazole
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
	rust (*Uromyces*)	myclobutanil triadimefon
Dieffenbachia	bacterial stem rot (*Erwinia*)	streptomycin
	leaf spot (*Leptosphaeria*)	mancozeb
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole.thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Dogwood	anthracnose (*Colletotrichum*)	azoxystrobin mancozeb maneb myclobutanil potassium bicarbonate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Dogwood (cont.)		thiophanate-methyl thiophanate-methyl/mancozeb
	blight (*Cercospora*)	chlorothalonil lime & copper sulfate mancozeb Potassium bicarbonate thiophanate-methyl
	leaf spot (*Septoria*)	chlorothalonil lime & copper sulfate mancozeb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Microsphaera,* *Phyllactinia*)	azoxystrobin myclobutanil potassium bicarbonate sulfur thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	mefenoxam
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Dracaena	leaf spot (*Fusarium*)	chlorthalonil iprodione mancozeb thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Durante skyflower	leaf spot (*Cercospora*)	thiophanate-methyl
Dusty miller	root rot (*Fusarium, Rhizoctonia,*	etridiazole/thiophanate-methyl thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Dusty miller (cont.)	*Thielaviopsis*)	
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl propamocarb hydrochloride thiophanate-methyl
Dutch iris	bulb rot (*Sclerotium*)	PCNB thiophanate-methyl
Dwarf bamboo	leaf spot (*Corynespora*)	copper sulfate thiophanate-methyl
	rust (*Puccinia*)	copper sulfate thiophanate-methyl
Easter lilies	bulb rot (*Fusarium, Penicillium*)	thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl PCNB thiophanate-methyl
Echeveria	root rot (*Phytophthora, Pythium*)	etridiazole
Elaeagnus	leaf spot (*Cercospora*)	copper sulfate thiophanate-methyl
	tip blight (*Gloeosporium*)	captan
Elm	anthracnose (*Gloeosporium*)	lime & copper sulfate mancozeb thiophanate-methyl
	leaf spot (*Cercospora*)	mancozeb thiophanate-methyl
	leaf spot (*Gnomonia*)	lime & copper sulfate mancozeb

Plant	Disease	Common Chemical [1,2,3]
Elm (cont.)	powdery mildew (M*icrosphaera,Phyllactinia, Uncinula*)	myclobutanil thiophanate-methyl triadimefon
English ivy	gray mold (*Botrytis*)	iprodione potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora, Colletotrichum*)	potassium bicarbonate sulfur
	powdery mildew (*Erysiphe*)	potassium bicarbonate thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	mefenoxam
	root rot (*Rhizoctonia*)	iprodione PCNB
	stem rot (*Fusarium, Rhizoctonia*)	
Euonymus	anthracnose (*Colletotrichum*)	azoxystrobin chlorothalonil copper hydroxide mancozeb potassium bicarbonate thiophanate-methyl thiophanate-methyl/ mancozeb
	leaf spot (*Cercospora) Ramularia, Septoria*)	chlorothalonil mancozeb potassium bicarbonate
	leaf spot (*Phyllosticta*)	copper sulfate chlorothalonil
	powdery mildew *(Microsphaera*)	myclobutanil potassium bicarbonate sulfur thiophanate-methyl triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/ thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Euonymus (cont.)		thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/ thiophanate-methyl iprodione thiophanate-methyl
Farkleberry	leaf spot (*Septoria*)	thiophanate-methyl
Fatsia	anthracnose (*Colletotrichum*)	azoxystrobin mancozeb thiophanate-methyl
	leaf spot (*Alternaria*)	azoxystrobin chlorothalonil thiophanate-methyl/mancozeb
	root rot (*Fusarium, Rhizoctonia Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
Ferns	blight (*Rhizoctonia*)	mancozeb
	gray mold (*Botrytis*)	mancozeb potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora*)	mancozeb potassium bicarbonate thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	*r*oot rot (*Phytophthora, Pythium*)	etridiazole/ thiophanate-methyl propamocarb hydrochloride thiophanate-methyl
Festuca	leaf spot (*Ascochyta, Septoria*)	thiophanate-methyl

Plant	Disease	Common Chemical [1,2,3]
Festuca (cont.)	root rot (*Rhizoctonia*)	thiophanate-methyl
	rust (*Puccinia*)	copper sulfate
Ficus	leaf spot (*Cercospora*)	chlorothalonil mancozeb thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Firethorn	scab (*Fusicladium*)	chlorothalonil mancozeb
Fittonia	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl PCNB thiophanate-methyl
Flowering almond	blossom blight (*Monilinia*)	chlorothalonil
	leaf spot (*Fabraea*)	chlorothalonil
	rust (*Tranzschelia*)	chlorothalonil
Forget-me-not	gray mold (*Botrytis*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	thiophanate-methyl
	rust (*Puccinia*)	copper sulfate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Forsythia	anthracnose *(Gloeosporium)*	captan potassium bicarbonate
	leaf spot (*Alternaria*)	azoxystrobin iprodione potassium bicarbonate
Four o'clock	leaf spot (*Cercospora*)	thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Foxglove	leaf spot (*Colletotrichm, Phyllosticta*)	sulfur
	root rot *(Phytophthora, Pythium*)	etridiazole mefenoxam
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Fringe-tree	leaf spot *(Cercospora, Septoria*) benomyl (*Phyllactinia*)	thiophanate-methyl powdery mildew thiophanate-methyl
Fuchsia	blight (*Botrytis*)	copper oleate mancozeb thiophanate-methyl vinclozolin
	blight (*Phomopsis, Septoria*)	copper oleate mancozeb
	rust (*Pucciniastrum*)	mancozeb myclobutanil
Gaillardia	leaf spot (*Septoria*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	myclobutanil thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Gaillardia (cont.)	root rot (*Phytophthora, Pythium*)	mefenoxam
	root rot (*Rhizoctonia*)	thiophanate-methyl
Gardenia	anthracnose (*Colletotrichum*)	thiophanate-methyl
	canker (*Phomopsis*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	petal blight (*Botrytis*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	azoxystrobin myclobutanil tyiophanate methyl triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl thiophanate-methyl
Geranium	blight (*Botrytis*)	azoxystrobin chlorothalonil dichloran iprodione lime & copper sulfate mancozeb maneb potassium bicarbonate thiophanate-methyl/mancozeb vinclozolin
	powdery mildew (*Erysiphe*)	azoxystrobin myclobutanil potassium bicarbonate thiophanate-methyl triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Geranium (cont.)	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	rust (*Puccinia*)	azoxystrobin chlorothalonil mancozeb myclobutanil triadimefon
Gerbera	powdery mildew (*Erysiphe*)	thiophanate-methyl triadimefon
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
Ginkgo	anthracnose (*Colletotrichum*)	chlorothalonil
Gladiolus	corm rot (*Fusarium, Penicillium*)	thiophanate-methyl
	damping off (*Fusarium, Rhizoctonia*)	captan thiophanate-methyl

Plant	Disease	Common Chemical [1,2,3]
Gladiolus (cont.)	flower spot (*Botrytis*)	chlorothalonil dichloran iprodione lime & copper sulfate mancozeb maneb potassium bicarbonate thiophanate-methyl vinclozolin zineb
	leaf spot (*Curvularia, Stemphylium*)	chlorothalonil lime & copper sulfate mancozeb maneb zineb
	neck dry rot (*Sclerotium*)	PCNB
Gloxinia	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl
Golden rain	leaf spot (*Cercospora*)	thiophanate-methyl
Grapeleaf ivy	anthracnose (*Colletotrichum*)	
	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Oidium*)	thiophanate-methyl triadimefon
Gynura	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Gynura (cont.)	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl PCNB thiophanate-methyl
Gypsophila	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl
Hackberry	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Uncinula*)	myclobutanil
Halesia	leaf spot (*Cercospora*)	thiophanate-methyl
Hawthorne	leaf spot (*Fabraea*)	chlorothalonil mancozeb myclobutanil
	powdery mildew (*Phyllactinia, Podosphaera*)	myclobutanil potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb triadimefon
	rust (*Gymnosporangium*)	chlorothalonil mancozeb myclobutanil triadimefon
	scab (*Venturia*)	mancozeb myclobutanil
Heather	root rot (*Phytophthora, Pythium*)	etridiazole
Hen & chickens	leaf spot (*Cercospora*)	thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Hibiscus	anthracnose (*Colletotrichum*)	azoxystrobin potassium bicarbonate thiophanate-methyl
	gray mold (*Botrytis*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Erysiphe, Microsphaera*)	azoxystrobin potassium bicarbonate sulfur thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	aluminum tris
	rust (*Kuehneola*)	copper sulfate
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Hickory	anthracnose (*Gnomonia*)	thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	powdery mildew (*Microsphaera*)	thiophanate-methyl
Holly	leaf spot (*Gloeosporium, Phyllosticta*)	chlorothalonil copper sulfate mancozeb potassium bicarbonate
	powdery mildew (*Microsphaera*)	azoxystrobin potassium bicarbonate sulfur thiophanate-methyl triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Holly (cont.)	purple spot (*Cercospora*)	chlorothalonil mancozeb potassium bicarbonate thiophanate-methyl
	root rot (*Rhizoctonia*)	iprodione PCNB thiophanate-methyl
	web blight (*Rhizoctonia*)	chlorothalonil iprodione
Hollyhock	anthracnose (*Colletotrichum*)	lime & copper sulfate mancozeb thiophanate-methyl zineb
Hollyhock	leaf spot (*Asochyta, Cercospora*)	lime & copper sulfate mancozeb sulfur thiophanate-methyl zineb
	petal blight (*Botrytis*)	mancozeb thiophanate-methyl zineb
	powdery mildew (*Erysiphe*)	myclobutanil sulfur thiophanate-methyl triadimefon
	rust (*Puccinia*)	chlorothalonil mancozeb myclobutanil sulfur thiophanate-methyl triadimefon zineb
Honey locust	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Microsphaera*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Honeysuckle	blight (*Herpobasidium*)	mancozeb
	leaf spot (*Corynespora, Phyllosticta*)	copper sulfate
	powdery mildew (*Microsphaera*)	myclobutanil thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	mefenoxam
Hornbean	leaf blister (*Taphrina*)	copper sulfate
	powdery mildew (*Microsphaera, Phyllactinia*)	thiophanate-methyl
Hosta	crown rot (*Botrytis*)	thiophanate-methyl
	leaf spot (*Colletotrichum, Phyllosticta*)	copper sulfate
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Hoya	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Huckleberry	leaf spot (*Phyllosticta*)	copper sulfate
Hyacinth	black rot (*Sclerotinia*)	PCNB thiophanate-methyl vinclozin
Hydrangea	blight (*Botrytis*)	chlorothalonil dichloran iprodione mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Hydrangea (cont.)		potassium bicarbonate thiophanate-methyl vinclozolin
	leaf spot (*Ascochyta, Colletotrichum*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	chlorothalonil mancozeb Potassium bicarbonate thiophanate-methyl
	leaf spot (*Phyllosticta*)	chlorothalonil copper sulfate
	powdery mildew (*Erysiphe*)	potassium bicarbonate sulfur thiophanate-methyl
	root rot (*Fusarium, Phytophthora, Pythium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	rust *(Pucciniastrum*)	chlorothalonil
Ilex	root rot (*Fusarium, Rhizoctonia Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
Impatiens	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl potassium bicarbonate thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Impatiens (cont.)	root rot (*Pytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
Iris	blossom blight (*Botrytis*)	chlorothalonil iprodione lime & copper sulfate mancozeb maneb potassium bicarbonate thiophanate-methyl vinclozolin
	bulb rot (*Fusarium, Penicillium*)	thiophanate-methyl
	crown rot (*Pellicularia*)	PCNB
	leaf spot (*Didymellina*)	chlorothalonil lime & copper sulfate mancozeb maneb myclobutanil potassium bicarbonate thiophanate-methyl
	rust (*Puccinia*)	azoxystrobin myclobutanil triadimefon
Ivy	bacterial leaf spot (*Xanthomonas*)	copper hydroxide
	blight (*Colletotrichum*)	lime & copper sulfate potassium bicarbonate
	root rot (*Fusarium, Phytophthora, Pythium, Rhizoctonia, Thielaviopsis*)	etriazole/thiophanate-methyl thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Japanese plum	anthracnose (*Colletotrichum*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Septoria*)	chlorothalonil potassium bicarbonate
	scab (*Fusicladium*)	copper sulfate
Japanese yew	leaf spot (*Cercospora, Phomopsis*)	thiophanate-methyl
Jasmine	leaf spot (*Colletotrichum*)	thiophanate-methyl
Java	leaf spot (*Cercospora, Septoria)*	thiophanate-methyl
Jerusalem cherry	anthracnose (*Colletotrichum)*	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
Jerusalem cherry (cont.)	stem rot (*Rhizoctonia*)	thiophanate-methyl
Jerusalem thorn	dieback (*Phomopsis*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Erysiphe*)	thiophanate-methyl triforine
Jujube	leaf spot (*Cercospora*)	thiophanate-methyl
	rust (*Phakopsora*)	copper sulfate
Juniper	blight (*Phomopsis*)	azoxystrobin potassium bicarbonate
	blight/leaf spot (*Cercospora, Phomopsis*)	lime & copper sulfate mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Juniper (cont.)		Potassium bicarbonate sulfur thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	rust (*Gymnosporangium*)	mancozeb thiophanate-methyl/mancozeb triadimefon
Justica	anthracnose (*Colletotrichum*)	benomyl thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Corynespora*)	copper sulfate
Kalanchoe	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Sphaerotheca*)	potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/ thiophanate-methyl
	root rot (Rhizoctonia)	etridiazole/ thiophanate-methyl iprodione PCNB thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Lantana	leaf spot (Colletotrichum)	thiophanate-methyl
	root rot (*Rhizoctonia*)	thiophanate-methyl
	rust (*Puccinia*)	copper sulfate
Larkspur	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
	stem rot (*Rhizoctonia*)	PCNB thiophanate-methyl
Leatherleaf fern	blight (*Ascochyta, Rhizoctonia*)	chlorothalonil potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora, Cylindrocladium*)	chlorothalnil potassium bicarbonate
Leopard plant	root rot (*Rhizoctonia*)	thiophanate-methyl
Leucothoe	leaf spot (*Cercospora*)	myclobuthanil thiophante methyl triadimefon
	root rot (*Fusarium, Phytophthora, Pythium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
Liatris	leaf spot (*Phyllosticta*)	copper sulfate
	leaf spot (*Septoria*)	thiophanate-methyl
	rust (*Coleosporium, Puccinia*)	copper sulfate
Ligularia	stem rot (*Rhizoctonia*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Ligustrum	leaf spot (*Cercospora*)	chlorothalonil mancozeb thiophanate-methyl chlorothalonil thiophanate-methyl
	powdery mildew (*Microsphaera*)	sulfur thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
Lily	blight (*Phytophthora*)	chlorothalonil
	gray mold (*Botrytis*)	chlorothalonil iprodione lime & copper sulfate mancozeb maneb thiophanate-methyl vinclozin
	root rot (*Rhizoctonia*)	PCNB
Linden	anthracnose (*Cercospora, Gloeosporium*)	lime & copper sulfate
	leaf spot (*Cercospora*)	lime & copper sulfate thiophanate-methyl
Liriope	anthracnose (*Colletotrichum*)	chlorothalonil
	leaf spot (*Cercospora*)	thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Lobelia	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl propamocarb hydrochloride thiophanate-methyl
Locust, black	anthracnose (*Colletotrichum*)	lime & copper sulfate thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Microsphaera*)	myclobutanil thiophanate-methyl triadimefon
Loquat	fire blight (*Erwinia*)	streptomycin sulfate tribasic copper sulfate
Lupine	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora, Ramularia*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	thiophanate-methyl
	rust (*Uromyces*)	copper sulfate
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Magnolia	algal leaf spot (*Cephaleuros*)	copper sulfate
	leaf spot (*Cercospora, Colletotrichum, Septoria*)	mancozeb thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Magnolia (cont.)	leaf spot (*Gloesporium*)	chlorothalonil mancozeb
	spot anthracnose (*Elsinoe*)	azoxystrobin mancozeb
	root rot (*Phytophthora, Pythium*)	etridiazole
Mahonia	leaf spot (*Cercospora*)	mancozeb thiophanate-methyl
	leaf spot (*Phyllosticta*)	mancozeb
Maple	anthracnose (*Gloeosporium*)	chlorothalonil lime & copper sulfate thiophanate-methyl
	leaf spot (*Alternaria, Phyllosticta*)	chlorothalonil mancozeb
	powdery mildew (*Uncinula*)	myclobutanil sulfur thophanate methyl triadimefon
	root rot (*Phytophthora, Pythium)*	etridiazole
Maranta	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl
Marigold	head blight (*Botrytis*)	chlorothalonil mancozeb Potassium bicarbonate thiophanate-methyl vinclozolin
	leaf spot (*Ascochyta, Cercospora, Septoria*)	chlorothalonil potassium bicarbonate triadimefon
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Marigold (cont.)		mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Mimosa	leaf spot (*Cercospora*)	thiophanate-methyl
Mock orange	blight (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Phyllactinia*)	myclobutanil thiophanate-methyl triadimefon
	rust (*Gymnosporangium*)	myclobutanil triadimefon
Monkey grass	anthracnose (*Colletotrichum*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	thiophanate-methyl
Morning glory	leaf spot (*Cercospora*)	thiophanate-methyl
	rust (*Coleosporium, Puccinia*)	copper sulfate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Mulberry	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Uncinula*)	thiophanate-methyl
	rust (*Cerotelium*)	copper sulfate
Mulberry, French	leaf spot (*Cercospora*)	thiophanate-methyl
Nandina	anthracnose (*Glomerella*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
Narcissus	blight (*Botrytis*)	chlorothalonil mancozeb thiophanate-methyl vinclozolin
	root rot (*Rhizoctonia*)	PCNB thiophanate-methyl
Nasturium	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	root rot (*Fusarium, Phytophthora, Pythium, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl thiophanate-methyl
Natal plum	anthracnose (*Colletotrichum*)	thiophanate-methyl
	blight (*Rhizoctonia*)	

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Natal plum (cont.)	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Oidium*)	thiophanate-methyl
Nephrolepis	root rot (*Phytophthora, Pythium*)	etridiazole
Nephthytis	leaf spot (*Cephalosporium*)	myclobutanil triadimefon
	root rot (*Phytophthora, Pythium*)	etridiazole
Norfolk island pine	root rot (*Phytophthora, Pythium*)	etridiazole
Oak	anthracnose (*Gloeosporium*)	chlorothalonil lime & copper sulfate mancozeb thiophanate-methyl
	leaf blister (*Taphrina*)	chlorothalonil lime & copper sulfate mancozeb
	leaf spot (*Actinopelte*)	chlorothalonil lime & copper sulfate Mancozeb
	leaf spot (*Cercospora, Septoria*)	chlorothalonil mancozeb thiophanate-methyl
	powdery mildew (*Erysiphe, Microspaera, Phyllactinia, Sphaerotheca*)	azoxystrobin myclobutanil thiophanate-methyl triadimefon
	rust (*Cronartium*)	copper sulfate
	spot anthracnose (*Gloeosporium*)	mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Oleander	anthracnose (*Gloeosporium*)	thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	spot anthracnose (*Sphaceloma*)	copper sulfate
Orchid	blossom blight (*Botrytis*)	mancozeb thiophanate-methyl vinclozolin
	root rot (*Phytophthora, Pythium*)	etridiazole
Oregon grape	leaf spot (*Cercospora*)	thiophanate-methyl
	rust (*Puccinia*)	chlorothalonil
Osage orange	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Ovularia*)	copper sulfate
	rust (*Cerotelium*)	copper sulfate
Osmanthus	leaf spot (*Phyllosticta*)	mancozeb
	leaf spot (*Septoria*)	thiophanate-methyl
Oyster plant	leaf spot (*Cercospora, Colletotrichum*)	thiophanate-methyl
	leaf spot (*Curvularia*)	chlorothalonil

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Oxalis	rust (*Puccinia*)	triforine
Pachysandra	blight (*Volutella*)	copper hydroxide mancozeb thiophanate-methyl/mancozeb
	leaf spot (*Phyllosticta*)	chlorothalonil copper sulfate
	stem rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Palm, sabal	leaf spot (*Ascochyta*)	copper sulfate potassium bicarbonate
	leaf spot (*Phyllosticta*)	copper sulfate
	root rot (*Rhizoctonia*)	iprodione
Palm, Washington	leaf spot (*Cercospora, Colletotrichum*)	potassium bicarbonate thiophanate-methyl
Pansy	anthracnose (*Colletotrichum*)	mancozeb maneb potassium bicarbonate thiophanate-methyl/mancozeb
	blight (*Botrytis*)	chlorothalonil iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl
	downy mildew (P*eronospora*)	lime & copper sulfate
	leaf spot (*Alternaria*)	chlorothalonil iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl/mancozeb

Plant	Disease	Common Chemical [1,2,3]
Pansy (cont.)		
	leaf spot (*Cercospora, Septoria*)	chlorothalonil mancozeb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Phyllosticta*)	chlorothalonil mancozeb thiophanate-methyl/mancozeb
	powdery mildew (*Sphaerotheca*)	myclobutanil potassium bicarbonate thiophanate-methyl triadimefon
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	rust (*Puccinia*)	mancozeb myclobutanil Triadimefon
	stem rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Parlor palm	leaf spot (*Helminthosporium*)	chlorothalonil potassium bicarbonate
Partridge berry	stem rot (*Rhizoctonia*)	thiophanate-methyl
Paulownia	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Phyllactinia, Uncinula*)	triadimefon

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Pawpaw	leaf spot (*Phyllosticta*)	copper sulfate
	leaf spot (*Septoria*)	thiophanate-methyl
Pearl bush	fire-blight (*Erwinia*)	Prune out infected limbs.
Pear, flowering	fire-blight (*Erwinia*)	streptomycin sulfate tribasic copper sulfate
	powdery mildew (*Podosphaera*)	myclobutanil thiophanate-methyl triadimefon
Pentas	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Corynespora, Phyllosticta*)	copper sulfate
	powdery mildew (*Oidium*)	thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Peony	blight (*Botrytis*)	lime & copper sulfate mancozeb maneb thiophanate-methyl
	blight (*Phytophthora*)	mancozeb maneb
	leaf spot (*Alternaria*)	mancozeb maneb
Peperomia	leaf spot (*Cercospora*)	chlorothalonil mancozeb potassium bicarbonate thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Peperomia (cont.)	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
Periwinkle	gray mold (*Botrytis*)	iprodione mancozeb potassium bicarbonate thiophanate-methyl
	leaf spot (*Colletotrichum, Phyllosticta*)	mancozeb
Persimmon	anthracnose (*Gloeosporium*)	thiophanate-methyl
	powdery mildew (*Podosphaera*)	thiophanate-methyl
Petunia	blight (*Phytophthora*)	chlorothalonil
	gray mold (*Botrytis*)	chlorothalonil mancozeb thiophanate-methyl thiophanate-methyl/manzate vinclozolin
	leaf spot (*Ascochyta, Cercospora*)	chlorothalonil mancozeb thiophanate-methyl/manzate
	powdery mildew (*Oidium*)	chlorothalonil myclobutanil sulfur thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	aluminum tris etridaizole etridaizole/thiophanate-methyl mefenoxam

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Petunia (cont.)		propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl PCNB thiophanate-methyl
Philodendron	bacterial leaf spot (*Erwinia*)	copper hydroxide streptomycin
	blight (*Phytophthora*)	chlorothalonil
	leaf spot (*Dactylaria*)	chlorothalonil mancozeb
	root rot (*Phytophthora,Pythium*)	aluminum tris etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl
Phlox	anthracnose (*Colletotrichum*)	lime & copper sulfate potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb triadimefon
	powdery mildew (*Erysiphe*)	myclobutanil potassium bicarbonate sulfur thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Phlox (cont.)	rust (*Puccinia*)	myclobutanil triadimefon
	southern blight (*Sclerotium*)	PCNB
	stem rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Phlox, perennial	gray mold (*Botrytis*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	potassium bicarbonate thiophanate-methyl
	powdery mildew (*Erysiphe*)	potassium bicarbonate thiophanate-methyl
	rust (*Puccinia, Uromyces*)	copper sulfate
	stem rot (*Rhizoctonia, Sclerotinia*)	thiophanate-methyl
Photinia	leaf spot (*Cercospora*)	chlorothalonil mancozeb thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Entomosporium*)	azoxystrobin chlorothalonil mancozeb myclobutanil propiconazole thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	powdery mildew (*Oidium*)	myclobutanil thiophanate-methyl triadimefon triforine

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Photinia (cont.)	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	rust (*Gymnosporangium*)	mancozeb myclobutanil triadimefon
Pieris	dieback (*Phytophthora*)	chlorothalonil
	leaf spot (*Phyllosticta*)	mancozeb
	root rot (*Phytophthora, Pythium*)	etridiazole
Pilea	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole /thiophanate-methyl
Pink	gray mold (*Botrytis*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Septoria*)	potassium bicarbonate thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	mefenoxam
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Pine	blight (*Lophodermella*)	chlorothalonil lime & copper sulfate
	brown spot (*Scirrhia*)	chlorothalonil
	canker (*Scleroderris*)	chlorothalonil
	needle case (*Lophodermium*)	chlorothalonil

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Pine (cont.)	root rot (*Phytophthora, Pythium*)	etridiazole etriciazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	rust (*Cronartium*)	triadimefon
	tip blight (*Sirococcus*)	azoxystrobin triadimefon
Pineapple guava	leaf spot (*Cercospora*)	thiophanate-methyl
Pittosporum	leaf spot (*Cercospora*)	mancozeb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Phyllosticta*)	mancozeb thiophanate-methyl/mancozeb
	root rot (*Phytophthora,* *Pythium*)	aluminum tris etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione thiophanate-methyl
Plane-tree	powdery mildew (*Microsphaera*)	thiophanate-methyl triforine
Plumbago	leaf spot (*Cercospora*)	thiophanate-methyl
	powdery mildew (*Oidium*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Podocarpus	root rot (*Phtophthora, Pythium*)	etridiazole etridiazole/thiophante methyl
Poinsettia	blight (*Amphobotrys, Botrytis*)	iprodione potassium bicarbonate
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	scab (*Sphaceloma*)	mancozeb thiophanate-methyl
Pomegranate	anthracnose (*Colletotrichum*)	thiophanate-methyl
	spot anthracnose (*Sphaceloma*)	copper sulfate
Poplar	leaf spot (*Marssonina*)	chlorothalonil
	powdery mildew (*Uncinula*)	sulfur thiophanate-methyl triadimefon
	rust (*Melampsora*)	triadimefon triforine
Poppy	gray mold (*Botrytis*)	iprodione potassium bicarbonate thiophanate-methyl vinclozolin
	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl

Plant	Disease	Common Chemical [1,2,3]
Poppy (cont.)	stem rot (*Rhizoctonia*)	iprodione thiophanate-methyl
Portulaca	root rot (*Phytophthora, Pythium*)	etridiazole PCNB propamocarb hydrochloride
	stem rot (*Rhizoctonia*)	thiophanate-methyl
Potentilla	rust (*Phragmidium*)	triadimefon
Pothos	leaf spot (*Alternaria, Fusarium Helminthosporium*)	iprodione potassium bicarbonate
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole mefenoxam
	root rot (*Rhizoctonia*)	PCNB thiophanate-methyl
Prayer plant	leaf spot (*Helminthosporium*)	chlorothalonil
Primrose	blight (*Botrytis*)	iprodione potassium bicarbonate thiophanate-methyl vinclozolin
	root rot (*Phytophthora, Pythium*)	mefenoxam
Privet	leaf spot (*Cercospora*)	chlorothalonil myclobutanil potassium bicarbonate thiophanate-methyl
	powdery mildew (*Microsphaera*)	azoxystrobin mancozeb myclobutanil potassium bicarbonate thiophanate-methyl triadimefon

Plant	Disease	Common Chemical [1,2,3]
Pyracantha	fire blight (*Erwinia*)	copper hydroxide streptomycin
	leaf spot (*Fabraea*)	mancozeb
	powdery mildew (*Podosphaera*)	potassium bicarbonate thiophanate-methyl triadimefon
	scab (*Venturia*)	chlorothalonil mancozeb thiophanate-methyl thiophanate-methyl/mancozeb
Quince	leaf spot (*Fabraea*)	chlorothalonil myclobutanil
	rust (*Gymnosporangium*)	chlorothalonil myclobutanil
Redbud	leaf spot (*Cercospora*)	thiophanate-methyl
Rose	spot anthracnose (*Elsinoe*)	calcium polysulfide
	black spot (*Diplocarpon*)	azoxystrobin benomyl calcium polysulfide captan chlorothalonil copper hydroxide copper oleate mancozeb maneb myclobutanil potassium bicarbonate propiconazole sulfur thiophanate-methyl thiophanate-methyl/mancozeb triforine
	blossom blight (*Botrytis*)	captan chlorothalonil copper oleate

Plant	Disease	Common Chemical [1,2,3]
Rose (cont'd.)		dichloran iprodione mancozeb potassium bicarbonate thiophanate-methyl
	leaf spot (*Alternaria*)	azoxystrobin chlorothalonil mancozeb maneb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Cercospora*)	chlorothalonil mancozeb maneb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	powdery mildew (*Sphaerotheca*)	azoxystrobin calcium polysulfide copper hydroxide copper oleate copper salts myclobutanil potassium bicarbonate propiconazole sulfur thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	root rot (*Phytophthora, Pythium*)	mefenoxam
	rust (*Phragmidium*)	azoxystrobin calcium polysulfide mancozeb maneb myclobutanil propiconazole sulfur triforine

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Rose (cont.)	storage rot (*Botrytis*)	dichloran mancozeb PCNB Potassium bicarbonate thiophanate-methyl
Rose of Sharon	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Cristulariella, Phyllosticta*)	copper sulfate
Rudbeckia	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	thiophanate-methyl
	rust (*Uromyces*)	copper sulfate
Russian olive	leaf spot (*Cercospora*)	myclobutanil thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon
Sage, Texas	powdery mildew (*Oidium*)	thiophanate-methyl
St. John's-wort	rust (*Uromyces*)	copper sulfate
Salvia	blight (*Botrytis*)	iprodione thiophanate-methyl vinclozolin
	leaf spot (*Cercospora*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Salvia	root rot (*Phytophthora,* *Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	rust (*Puccinia*)	myclobutanil triadimefon
	stem and root rot (*Rhizoctonia*)	iprodione PCNB thiophanate-methyl
Sansevieria	root rot (*Phytophthora, Pythium*)	etridiazole
Santolina	blight (*Rhizoctonia*)	mancozeb
Sassafras	leaf spot (*Phyllosticta*)	copper sulfate
	leaf spot (*Septoria*)	thiophanate-methyl
	powdery mildew (*Phyllactinia*)	thiophanate-methyl
Scabiosa	leaf spot (*Cercospora, Ramularia* *Septoria*)	copper sulfate
	powdery mildew (*Erysiphe*)	thiophanate-methyl
	rust (*Puccinia*)	copper sulfate
Schefflera	anthracnose (*Colletotrichum*)	potassium bicarbonate thiophanate-methyl/mancozeb
	blight (*Alternaria*)	mancozeb potassium bicarbonate

Plant	Disease	Common Chemical [1,2,3]
Schefflera (cont.)	leaf spot (*Cercospora*)	potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	twig blight (*Pestalotia, Phomopsis*)	potassium bicarbonate thiophanate-methyl/mancozeb
Sedum	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	leaf spot (*Corynespora, Phyllosticta*)	copper sulfate
	powdery mildew (*Erysiphe*)	thiophanate-methyl triadimefon
	root rot (*Phytophthora, Pythium*)	mefenoxam
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Seedlings (general)	damping off	captan
Sempervivum	root rot (*Phytophthora, Pythium*)	mefenoxam
Shasta daisy	root rot (*Phytophthora, Pythium*)	mefenoxam
Sinningia	root rot (*Phytophthora, Pythium*)	etridiazole

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Snapdragon	blight (*Botrytis*)	iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb vinclozolin
	downy mildew (*Peronospora*)	maneb thiophanate-methyl/mancozeb
	leaf spot (*Cerospora*)	mancozeb potassium bicarbonate Sulfur thiophanate-methyl thiophanate-methyl/mancozeb
	leaf spot (*Colletotrichum, Phyllosticta*)	mancozeb sulfur thiophanate-methyl/mancozeb
	powdery mildew (*Erysiphe*)	copper oleate myclobutanil Potassium bicarbonate sulfur thiophanate-methyl triadimefon triforine
	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophante methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	rust (*Puccinia*)	mancozeb maneb myclobutanil propiconazole sulfur triadimefon zineb

Plant	Disease	Common Chemical [1,2,3]
Snapdragon (cont.)	stem rot (*Rhizoctonia*)	PCNB thiophanate-methyl
Sourwood	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
Spathiphyllum	leaf spot (*Alternaria, Colletotrichum*)	thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	aluminum tris
	root rot (*Rhizoctonia*)	iprodione thiophanate-methyl
	stem blight (*Rhizoctonia*)	thiophanate-methyl/mancozeb
Spider plant	downy mildew (*Peronospora*)	copper sulfate
	leaf spot (*Cercospora*)	thiophanate-methyl
Spiraea	leaf spot (*Cercospora*)	chlorothalonil thiophanate-methyl
	powdery mildew (*Podosphaera*)	myclobutanil sulfur thiophanate-methyl triadimefon
Star magnolia	leaf spot (*Cercospora, Colletotrichum*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
Statice	anthracnose (*Colletotrichum*)	chlorothalonil potassium bicarbonate thiophante methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Statice (cont.)	leaf blight (*Alternaria, Botrytis Cercospora*)	chlorothalonil mancozeb potassium bicarbonate
	leaf spot (*Alternaria, Botrytis, Fusarium Helminthosporium*)	iprodione potassium bicarbonate
	root rot (*Fusarium,Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl thiophanate-methyl
Stock	gray mold (*Botrytis*)	thiophanate-methyl/mancozeb
	leaf spot (*Alternaria*)	thiophanate-methyl/mancozeb
	white rust (*Albugo*)	copper oleate
Stokesia	head blight (*Botrytis*)	thiophanate-methyl
	leaf spot (*Ascochyta, Cercospora*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	root rot (*Phyllosticta*)	etridiazole
Strawberry geranium	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Rhizoctonia*)	
Strawflower	downy mildew (*Uremia*)	copper sulfate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Stromanthe	root rot (*Phytophthora, Pythium*)	etridiazole
Sumac	leaf blister (*Taphrina*)	copper sulfate
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	rust (*Pileolaria*)	copper sulfate
Sunflower	downy mildew (*Plasmopara*)	copper sulfate
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	myclobutanil thiophanate-methyl triadimefon
	rust (*Puccinia*)	myclobutanil triadimefon
Sweet gum	anthracnose (*Gloeosporium*)	thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
Sweet olive	anthracnose (*Colletotrichum*)	thiophanate-methyl
Sweet pea	downy mildew (*Peronospora*)	copper sulfate
	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Ascochyta, Colletotrichum, Phyllosticta*)	copper oleate
	powdery mildew (*Erysiphe, Microsphaera*)	sulfur thiophanate-methyl

Plant	Disease	Common Chemical [1,2,3]
Sweet pea (cont.)	rust (*Uromyces*)	copper sulfate
	stem rot (*Rhizoctonia*)	PCNB thiophanate-methyl
Sweet William	leaf spot (*Heterosporium*)	propiconazole
Sycamore	anthracnose (*Gloeosporium*)	chlorothalonil copper oleate copper salts lime & copper sulfate mancozeb thiophanate-methyl/mancozeb
	leaf spot (*Cercospora, Septoria*)	chlorothalonil mancozeb thiophanate-methyl
	leaf spot (*Tubakia*)	copper sulfate
Syngonium	leaf spot (*Cephalosporium*)	chlorothalonil mancozeb
	root rot (*Fusarium, Phytophthora, Pythium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl
Tallow	leaf spot (*Phomopsis*)	
	leaf spot (*Phyllosticta*)	copper sulfate
Titi	leaf spot (*Phyllosticta*)	copper sulfate
	rust (*Phytophthora, Pythium*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	PCNB thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Tritoma	anthracnose (*Colletotrichum*)	thiophanate-methyl
Tuberous bengonia	leaf spot (*Cercospora, Phomopsis*)	copper sulfate
	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Erysiphe*)	captan thiophanate-methyl
	rot (*Pythium, Rhizoctonia*)	captan
Tulips	anthracnose (*Gloeosporium*)	lime & copper sulfate
	blight (*Botrytis*)	chlorothalonil iprodione mancozeb thiophanate-methyl vinclozin
	bulb rot (*Fusarium, Penicillium*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	iprodione mancozeb thiophanate-methyl
Tulip poplar	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	leaf spot (*Septoria*)	thiophanate-methyl
	powdery mildew (*Oidium*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Tung oil	anthracnose (*Glomerella*)	thiophanate-methyl
	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
Tupelo	leaf spot (*Cercospora*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	rust (*Aplopsora*)	copper sulfate
Turkey ivy	leaf spot (*Ramularia, Septoria*)	thiophanate-methyl
Verbena	flower blight (*Botrytis*)	mancozeb potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora, Septoria*)	potassium bicarbonate thiophanate-methyl
	powdery mildew (*Erysiphe*)	potassium bicarbonate sulfur thiophanate-methyl
	root rot (*Phytophthora, Pythium*)	etridiazole/thiophanate-methyl mefenoxam propamocarb hydrochloride thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl thiophanate-methyl
	rust (*Puccinia*)	mancozeb

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Viburnum	leaf spot (*Cercospora*)	mancozeb potassium bicarbonate thiophanate-methyl
	powdery mildew (*Microsphaera*)	azoxystrobin chlorothalonil myclobutanil potassium bicarbonate thiophanate-methyl triadimefon
	rust (*Puccinia*)	azoxystrobin myclobutanil triadimefon
Vinca	flower blight (*Botrytis*)	thiophanate-methyl thiophanate-methyl/mancozeb vinclozolin
	root rot (*Phytophthora, Pythium*)	aluminum tris etridiazole mefenoxam propamocarb hydrochloride
	root rot (*Rhizoctonia*)	PCNB
Violet	downy mildew (*Bremiella*)	copper sulfate
	gray mold (*Botrytis*)	iprodione potassium bicarbonate thiophanate-methyl vinclozolin
	leaf spot (*Cercospora, Colletotrichum*)	potassium bicarbonate thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Sphaerotheca*)	potassium bicarbonate sulfur thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Violet (cont.)	root rot (*Phytophthora, Pythium*)	propamocarb hydrochloride
	root rot (*Rhizoctonia*)	iprodione thiophante methyl
	rust (*Puccinia*)	copper sulfate
	spot anthracnose (*Sphaceloma*)	copper sulfate
	stem rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Vitex	leaf spot (*Cercospora*)	thiophanate-methyl
Walnut	leaf spot (*Gnomonia*)	copper sulfate
	powdery mildew (*Microsphaera*)	myclobutanil thiophanate-methyl triadimefon
Wandering Jew	gray mold (*Botrytis*)	thiophanate-methyl
	leaf spot (*Cercospora, Colletotrichum*)	thiophanate-methyl
	root rot (*Fusarium, Rhizoctonia*)	thiophanate-methyl
Wax myrtle	leaf spot (*Cercospora, Septoria*)	thiophanate-methyl
	leaf spot (*Phyllosticta*)	copper sulfate
	rust (*Gymnosporangium*)	copper sulfate
Weigela	leaf spot (*Cercospora*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Willow	powdery mildew (*Uncinula*)	myclobutanil sulfur thiophanate-methyl triadimefon
	rust (*Melampsora*)	triadimefon
	twig blight (*Diplodia*)	lime & copper sulfate
Winter honeysuckle	dieback	Prune out affected areas
Witch hazel	leaf spot (*Phyllosticta*)	copper sulfate
	powdery mildew (*Podosphaera*)	thiophanate-methyl
Yarrow	anthracnose (*Colletotrichum*)	thiophanate-methyl
	powdery mildew (*Erysiphe*)	thiophanate-methyl
	root rot (*Rhizoctonia*)	thiophanate-methyl
	rust (*Puccinia*)	copper sulfate
Yaupon	anthracnose (*Colletotrichum*)	thiophanate-methyl
	leaf spot (*Diplodia, Macrophoma, Phyllosticta*)	copper sulfate
Yew	root rot (*Phytophthora, Pythium*)	mefenoxam
	twig blight (*Physalospora*)	lime & copper sulfate

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Zinnia	blight (*Botrytis*)	chlorothalonil iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb vinclozolin
	leaf blight (*Alternaria*)	chlorothalonil iprodione mancozeb maneb potassium bicarbonate thiophanate-methyl
	leaf spot (*Cercospora*)	chlorothalonil mancozeb maneb myclobutanil potassium bicarbonate thiophanate-methyl thiophanate-methyl/mancozeb triadimefon
	powdery mildew (*Erysiphe*)	chlorothalonil myclobutanil potassium bicarbonate sulfur thiophanate-methyl thiophanate-methyl/mancozeb triadimefon triforine
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl
	root rot (*Rhizoctonia*)	etridiazole/thiophanate-methyl iprodione PCNB thiophanate-methyl
	stem rot (*Fusarium, Rhizoctonia, Sclerotinia*)	thiophanate-methyl

Ornamentals

Plant	Disease	Common Chemical [1,2,3]
Zygocactus	root rot (*Fusarium, Rhizoctonia, Thielaviopsis*)	etridiazole/thiophanate-methyl thiophanate-methyl thiophanate-methyl/mancozeb
	root rot (*Phytophthora, Pythium*)	etridiazole etridiazole/thiophanate-methyl mefenoxam thiophanate-methyl

[1] Check label for specific ornamental and disease before using.
[2] Always use label rate of the product of choice.
[3] Benomyl should be alternated with other recommended fungicides to reduce the possibility of benomyl resistance.

Christmas Tree Diseases

Crop	Diseases	Fungicides	Rate	Remarks
Christmas Trees	Tip Blight	Manicure 6	2 – 3.5 pts/100 gal	21 – day intervals
	Needle Cast	Daconil 2787 Quadris	4 – 8 pts/100 gal 6 – 15 ozs/A	Use lower rates on young trees.
	Swiss Needle Cast	Daconil Weather STIK Quadris	2 – 3.5 pts/100 gal 6 – 15 ozs/A	Alternate with other fungicides.
Conifers	Needle Cast Cercospora Blight	Protect T/O Dithane T/O	1.5 lbs/100 gal 1.5 lbs/100 gal	7 to 10 day intervals 7 to 10 day intervals
	Phomopsis Blight Tip Blight	Banner Maxx	5 – 8 ozs/100 gal	14 to 21 day intervals
	Rhizosphaera Needle Cast Scleroderris Canker	Thalonil 90	1.25 lbs/100 gal	14 day intervals
Pine Juniper	Tip Blight Twig Blight	Cleary 3336 Cavalier 50WSB	10 – 20 ozs/100 gal 12 – 24 ozs/100 gal	7 to 10 day intervals 10 day intervals
	Leaf Blight Rust	Bayleton 25 Bayleton 50	11 ozs/100 gal 5.5 ozs/100 gal	14 to 21 day intervals
	Anthracnose	Kocide	Mfg. label	For general ornamental use.
Conifers in Nurseries	Phytophthora Root Rot	Subdue 2 E	2.5 pts/50 gal 5 pts/50 gal	Seed bed use Transplants

Turfgrass Diseases

Disease	Common Chemical_	Fungicide_
Algae	Chlorothalonil	Daconil Weatherstik Daconil Ultrex Daconil ZN
	Chlorothalonil + Thiophante Methyl	Spectro 90WDG ConSyst
	Copper Hydroxide	Kocide 2000 T & O
	Maneb	Pentathlon
	Mancozeb	Diathane Fore Rainshield Formec 80 Mancozeb Pentathlon DF Protect T/O
	Mancozeb + Copper Hydroxide	Junction
	Mancozeb + Myclobutanil	Manhandle
	Quartenary Ammonium Coupounds	Physan 20 RD – 20
Bermudagrass Decline *(Gaeumannomyces graminis graminis)*	Azoxystrobin	Heritage
	Chlorothalonil + Fenarinol	Twosome Flowable Fungicide
	Fenarimol	Rubigan Patchwork
	Propiconazole	Bannermax
	Triadimefon	1% Turf Fungicide W/Bayleton Accost Bayleton Bayleton Systemic Fungicide Fungi-Sol Lawn Fungicide, Bayleton 1G
Brown patch (*Rhizoctonia solani.)*	Azoxystrobin	Heritage
	Captan	Captan
	Chloroneb	Chlorneb, Fungicide V

Disease	Common Chemical	Fungicide
Brown patch (cont'd)		Teremec SP
	Chloroneb + Thiophanate-methyl	Fungicide IX
	Chlorothalonil	Bravado Chlorostar Concorde SST Daconil Daconil Weatherstik Daconil Ultrex Daconil ZN Echo 720 Echo 90DF Echo 500DF Manicure Turf Fungicide
	Chlorothalonil + Fenarimol	Twosome Flowable Fungicide
	Chlorothalonil + Thiophanate-methyl	Spectro 90 WDG ConSyst
	Cyproconazole	Sentinel
	Fenarimol	Rubigan Patchwork
	Fludioxonil	Medallion
	Flutonil	ProStar
	Iprodione	18 Plus 26019 26GT Fungicide X Iprodione Pro 25B
	Maneb	Pentathlon
	Mancozeb	Dithane Fore Rainshield Formec 80 Mancozeb Pentathlon DF Protect T/O
	Mancozeb + Copper Hydroxide	Junction

Turfgrass Diseases

Disease	Common Chemical_	Fungicide_
Brown patch (cont'd)	Mancozeb + Myclobutanil	Eagle Golden Eagle
	PCNB	Defend Engage ParFlo-4F PCNB PCNB WSP PCNB 75W Penstar Revere Terraclor Turfcide Turfcide400
	Polyoxin – D	Endorse
	Propamocarb + Chlorothalonil	Banol C Lescopar
	Propiconazole	Banner Maxx
	Quartenary Ammonium Compounds	Physan 20 RD – 2-
	Thiophate Methyl	Cleary - 3336 Fungo Flo Fungo Flo 50 WSB Systemic Fungicide Systec 1998 T-Methyl Pro 4.5F T-Methyl 50 WSB T-Storm 2G T-Storm 50 WSB T-Storm 4.5 F
	Thiophanate-methyl + Iprodione	Fluid Fungicide
	Thiophanate-methyl + Mancozeb	Duosan WP Duosan WSB
	Thiran	Defiant Spotrete
	Triadimefon	1% Turf Fungicide W/Bayleton Accost Bayleton

Turfgrass Diseases

Disease	Common Chemical_	Fungicide_
Brown Patch (cont'd)		Bayleton Systemic Fungicide Fungicide VII Fungisol Lawn Fungicide
	Triadimefon Mefenoxam	Fluid Fungicide II
Centipedegrass Mosaic (strain of panicum mosaic virus)	No control other than good cultural practices. Avoid infected sod for new lawns.	
Dollar Spot (*Sclerotinia* sp.)	Chloroneb + Thiophanate	Fungicide
	Chlorothalonil	Bravado Chlorostar Concorde SST Daconil Daconil Weatherstik Daconil Ultrex Daconil ZN Echo 720 Echo 90DF Echo 500DF Manicure Turf Fungicide
	Chlorothalonil + Fenarimol	Twosome Flowable Fungicide
	Chlorothalonil + Thiophanate-methyl	Spectro 90WDG ConSyst
	Cyproconzaole	Sentinel
	Fenarimol	Rubigan Patchwork
	Iprodione	18 Plus 26019 26GT Fungicide X Iprodione Pro 25E
	Mancozeb	Dithane Fore Rainshield Formec 80 Pentathlon DF Protect T/O

Disease	Common Chemical_	Fungicide_
Dollar Spot (cont'd.)	Mancozeb + Copper Hydroxide	Junction
	Mancozeb + Myclobutanil	Manhandle
	Maneb	Pentathlon
	Myclobutanil	Eagle Golden Eagle
	PCNB	Defend Engage Par Flo 4F PCNB PCNB 10G PCNB WSP PCNB 75W Penstar Revere Terraclor Turfcide Turfcide 400
	Propancarb + Chlorothalonil	Banol C Lesco Par
	Propiconazole	Bannermaxx
	Quartenary Ammonium Compounds	Physan 20 RD – 20
	Thiophanate-methyl	3336 Fungo Flo Fungo Flo 50WSB Fungo Flo Systemic Fungicide SysTec 1998 T-Methyl Pro 4.5F T-Methyl 50WSB T-Storm 2G T-Storm 50WSB T-Storm 4.5F
	Thiophanate-methyl + Iprodione	Fluid Fungicide
	Thiophanate-methyl + Mancozeb	Duson WP Duosan WSB

Turfgrass Diseases

Disease	Common Chemical	Fungicide
Dollar Spot (cont'd.)	Thiram	Defiant Spotrete
	Triadimefon	1% Turf Fungicide With Bayleton Bayleton Bayleton Systemic Fungicide Fungicide VII Fungisol Lawn Fungicide
	Triadimefon + Metalaxyl	Fluid Fungicide II
	Vinclozolin	Curalan Touche
Fairy Ring	Azoxystrobin	Heritage
	Flutolanil	Prostar
Gray Leaf Spot (*Pyricularia* sp.)	Azoxystrobin	Heritage
	Chloroneb + Thiophanate-methyl	Fungicide IX
	Chlorothalonil	Bravado Chlorostar Concorde SST Daconil Daconil Weatherstik Daconil Ultrex Daconil ZN Echo 720 Echo 90DF Echo 500DF Manicure Turf Fungicide
	Chlorothalonil + Fenarimol	Twosome Flowable Fungicide
	Chlorothalonil + Thiophanate-methyl	Spectro 90WDG ConSyst
	Cyproconazole	Sentinel
	Mancozeb	Dithane Fore Rainshield Formec 80

Turfgrass Diseases

Disease	Common Chemical	Fungicide
Gray Leaf Spot (cont'd.)	Mancozeb	Mancozeb Pentathlon DF Protect T/O
	Mancozeb + Myclobutanil	Manhandle
	Propamoarb + Chlorothalonil	Banol C Lesco Par
	Propiconazole	Bannermaxx
	Thiophanate-methyl	3336 Fungo Flo Fungo Flo 50WSB Systec 1998 T-Methyl Pro 4.5F T-Methyl 50WSB T-Storm 2G T-Storm 50WSB T-Storm 4.5F
	Thiophanate-methyl + Mancozeb	Duosan WP Duson WSB
	Triadimefon	1% Turf Fungicide With Bayleton Accost Bayleton Bayleton Systemic Fungicide Fungicide VII Fungisol Lawn Fungicide
	Trifloxystrobin	Compass
Melting Out/ "Helminthosporium" Leafspot (*Helminthosporium* sp.)	Azoxystrobin	Heritage
	Captan	Captan Captec
	Chlorothalonil	Bravado Chlorostar Concorde SST Daconil Daconil Weatherstik Daconil Ultrex Daconil ZN

Turfgrass Diseases

Disease	Common Chemical	Fungicide
Melting Out (cont'd.)	Chlorothalonil	Echo 720
		Echo 90DF
		Echo 500DF
		Manicure
		Turf Fungicide
	Chlorothalonil + /Fenarimol	Twosome Flowable Fungicide
	Chlorothalonil + Thiophanate-methyl	Spectro 90WDG
		ConSyst
	Fenarimol	Rubigan
		Patchwork
	Fludioxonil	Medallion
	Iprodione	18 Plus
		26019
		26GT
		Fungicide X
		Iprodione Pro 25E
	Mancozeb	Dithane
		Fore Rainshield
		Formec 80
		Mancozeb
		Pathathlon DF
		Protect T/O
	Maneb	Pentathlon
	Myclobutanil	Eagle
		Golden Eagle
	PCNB	Defend
		Engage
		Par Flo 4F
		PCNB
		PCNB 10G
		PCNB WSP
		PCNB 75W
		Penstar
		Revere
		Terraclor
		Turfcide
		Turfcide 400

Turfgrass Diseases

Disease	Common Chemical	Fungicide
Melting Out (cont'd)	Propamocarb + Chlorothalonil	Banol C Lesco Par
	Propiconazole	Banner Maxx
	Quartenary Ammonium Compounds	Physan 20 RD – 20
	Thiophanate-methyl	3336 Fungo Flo Fungo Flo 50WSB Systemic Fungicide Systec 1998 T-Methyl Pro 4.5F T-Methyl 50WSB T-Storm 2G T-Storm 50WSB T-Storm 4.5F
	Thiophanate-methyl + Iprodione	Fluid Fungicide
	Thiophanate-methyl + Mancozeb	Duosan WP Duson WSB
	Thiram	Defiant Spotrete
	Trifloxystrobin	Compass
	Vinclozolin	Curalan Touche
Nematodes	See table on Nematode Control in Turf	
Pythium Blight (*Pythium* sp.)	Azoxystrobin	Heritage
	Chloroneb	Chloroneb Fungicide V Teremec SP
	Chloroneb + Thiophanate-methyl	Fungicide IX
	Etridiazole	Koban Terrazole
	Fosetyl al	Monterey Aliette Prodigy Signature

Disease	Common Chemical	Fungicide
Pythium Blight (cont'd.)		Signature
	Mancozeb	Dithane Fore Rainshield Formec 80 Mancozeb Pentathlon Protect T/O
	Mancozeb + Myclobutanil	Manhandle
	Maneb	Pentathlon
	Mefenoxam	Mefenoxam 2 Pythium Control Subdue Maxx GR
	Propamocarb	Banol
	Propamocarb + Chlorothalonil	Banol C Lesco Par
	Triadimefon + Metalaxyl	Fluid Fungicide II
Slime Mold (*Physarum* sp., *Fuligo* sp.)	Brush or wash the mold off the grass. Mowing will eliminate the condition.	
St. Augustine Decline SAD (strain of panicum mosaic virus)	Control by replacing infected areas with other grasses such as bermudagrass. No specific control other than good cultural practices on infected lawns, use of resistant cultivars and avoidance of infected sod for new lawns.	

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Asparagus	Rust	Mancozeb Dithane F-45 Maneb	2 lbs/100 gal 2 qts/100 gal 2 lbs/100 gal	0	10 day intervals. Apply only after spears have been harvested.
	Phytophthora sp.	Ridomil Gold	1 pt/A	1	Apply to beds in at least 10 gals of water.
Bean (snap)	Bacterial blights	Fixed Copper	Mfg. label. See appendix for a list of Fixed Copper fungicides.	0	1st appearance; 5 to 10 day intervals. Use western-grown seed. Rotate every 3 years.
	Powdery Mildew	Sulfur WP MilStop	4–7.8 lbs/100 gals 2.5-5 lbs/Ac	0	1st appearance; 7 to 10 day intervals. Avoid using sulfur above 90 degrees F.
	Root Rot Damping Off (*Rhizoctonia* sp., *Pythium* sp.)	PCNB 75 WP (drench) Terraclor 2E	1.3-2 lbs/100 gals 4 – 6 pts/A	-	Apply as directed spray water/8400 ft row in band in seed furrow. Do not feed treated vines to livestock.
		Terraclor 4F Ridomil Gold	2-3 pts/A .5-1 pt/A		Apply in-furrow at planting. Ridomil for pythium only.
	Rust	Chlorothalonil	Mfg. label	7	1st appearance; 5 to 10 day intervals.
		Terranil-S Sulfur WP	4-7.8 lbs/100 gals	0	Do not feed treated vines to livestock. Avoid using sulfur above 90 degrees F.
		Nova 40 W	4-5 oz	0	

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Bean (snap) (cont'd.)	White Mold, *Sclerotinia* sp.	Botran 75W	2.25 lbs/A 4 lbs/A	2 2	Bush varieties
		PCNB 75WP	2.75 lbs/15-20 gals (8400 lin ft)	-	In-furrow spray.
		Rovral 4-F Thiophanate-methyl	1.5 – 2 pts Manufactors label	14 14	Apply at first bloom Alternate with other fungicides.
Bean (lima)	Rust Anthracnose *Cercospora Leaf* Spot	Chlorothalonil	Mfg. label.	6 weeks	Use on dry beans only.
	Bacterial Blight White Mold (*Sclerotinia)*	Fixed Copper	Mfg. label. See appendix	0	7 to 14 day intervals.
	Gray Mold (*Botrytis)*	Roval	1.5-2 lbs/A	14	Do not use past full bloom.
		Topsin-M	1.5-2 lbs/A	28	Do not apply past bloom.
	Pythium Root Rot Rhizoctonia Rot	Ridomil Gold	.5 – 1 pts/A	-	Preplant incorporated or as a band treatment.
		Terraclor 75W Terraclor 2E	1.5-2 lbs/A 2-3 qts/A	-	Directed spray to the seed furrow. Spray planting furrow and covering soil.
	Powdery Mildew	Sulfur	4-7.8 lbs/100 gals	0	Avoid using sulfur above 90 degrees F.
	Viruses	None	None		Obtain western-grown seed. Do not save seed from year to year.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Beets	Leaf Blight	Fixed Copper	Mfg. label See appendix.	0	7 to 10 day intervals.
Beets (cont'd)	Alternaria Leaf Spot	Cabrio	8 – 12 ozs/A	0	Maximum of 3 applications.
	Pythium	Ridomil Gold	1-2 pts/treated A	-	Apply on band or broadcast.
Broccoli and Brussels Sprouts	Alternaria Leaf Spot Downy Mildew	Aliette Aliette/Maneb Chlorothalonil	2-5 lbs/A 4 lbs/A Mfg. label.	3 0	Aliette for Downy Mildew, maneb for alternaria.
		Ridomil Gold-Bravo Fixed Copper	1.5 lbs/100 gals Mfg. label. See appendix.	7	1st appearance; 7 to 10 day intervals. Apply at 14 day intervals.
		Maneb 80 Maneb + Zn	1.5-2 lbs/A 1.2-1.6 qts/A	7 7	Remove residue by washing or trimming if application is made within 3 days of harvest. 7 to 10 day intervals.
	Blackleg	Rovral Iprodione	Mfg. label Mfg. label	0 0	PHI
	Pythium sp. Damping Off	Ridomil Gold	.25-.5 pts/A 1-2 pts/A	-	For damping off only. For surface application.
	Wire Stem & Stem Rot	PCNB 75 WP	15-20 lbs/50 gals/A	-	At planting. Broadcast
		PCNB 75WP	10-15 lbs/35 gals/A	-	12-15" band.
		Terraclor 10G	9-11 lbs/1000 ft	-	In 8" band.
		Terraclor 4F	2 gals/A	-	Row drench in band.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Cabbage (cont'd)	Black Leg Black Rot Downy Mildew	Fixed Copper	Mfg. label. See appendix for List of fixed coppers.	0	7 to 10 day interval. Use hot water treated or western grown seed. Two year rotation. Direct seed when possible. Use resistant varieties.
	Damping Off Wire Stem (plant bed)	Terraclor 4F	1 T/gal/50 sq ft of bed	-	Apply at seeding.
	Tipburn	Calcium	Soil test		More prevalent in late planted spring crops. Liming helps reduce tipburn. Irrigate, if needed.
	Wire Stem & Head Rot	PCNB 75WP	15-20 lbs/50gals/A	-	At planting. Broadcast.
		PCNB 75WP	10-15 lbs/35 gals/A		12-15" band.
		Terraclor 10G	9-11 lbs/1000 ft. row		In 8" band.
		Terraclor 4F	2 gals/A		Apply as row drench in band
	Yellows	None			Use resistant varieties.
Cantaloupe	Alternaria Anthracnose Cercospora Target Spot	Aliette/Maneb, Chlorothalonil	4 lbs/A Mfg. label.	5 0	7 to 10 day interval. 1st appearance; 7 to 10 day intervals. Shorten interval under severe disease pressure. Repeated use may cause yellowing.
	Gummy Stem Blight	Fixed Copper	Mfg. label.	0	
	Downy Mildew	Mancozeb	2-3 lbs/A	5	
		Maneb 80	1-2 lbs/A	5	
		Ridomil Gold-Bravo	2-3 lbs	0	
		Quadris	11-15.4 ozs/A	1	Alternate with other fungicides.
		Cabrio	8-16 ozs/A	0	PHI

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Cantaloupe (cont'd)	Powdery Mildew	Bayleton	2-4 ozs/A	1	Use at least 10 gals water per acre. 14 day
		Chlorothalonil	Mfg. label.	0	intervals.
		Ridomil Gold-Bravo	1.2-2 lbs/A	0	1st appearance; additional
		Ridomil Gold-MZ	1.5 – 2 lbs/A	0	applications at 5 to 7 day intervals. 14 day
		Reach	3-4 pts/A	0	intervals.
		Nova	2.5-5 ozs/A	0	
		Procure	4-8 ozs/A	0	
	Pythium sp. Damping Off Cottony Leak	Ridomil Gold	1-2 pts/A	-	Broadcast application.
	Bacterial Wilt	Insecticides			Control cucumber beetles which spread the disease. See Insect Control Guide.
Carrot	*Phythophthora, Alternaria &* *Cercospora* Leaf Blights	Chlorothalonil	Mfg. label	0	1st appearance; 7 to 10 day intervals. Not for <u>*Cercospora.*</u>
			Mfg. label	0	
		Fixed Copper	See appendix.		
			1-2 pts/A	0	
		Quadris	9.2 – 15.4 ozs/A	1	7 to 14 day intervals. Alternate with other
		Iprodione	1-2 lbs	7	fungicides.
		Rovral 4F	1-2 pts		Do not make more
		Ridomil Gold-Bravo	1.5-2 lbs/A	7	than 4 applications per season. 14 day
		Cabrio	16 oz/A	0	schedule. Alternate with other fungicides
	Pythium sp. *Phytophthora* sp.	Ridomil Gold	1-2 pts/A	0	Preplant incorporated or soil surface spray.
Cauliflower	Alternaria Leaf Spot	Aliette	2-5 lbs/A	3	Aliette for Downy Mildew, maneb for Alternaria.
		Aliette/Maneb	4 lbs/A		
	Downy Mildew	Chlorothalonil	Mfg. label	7	1st appearance; 7 to 10 day intervals.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Cauliflower (cont'd.)		Ridomil Gold-Bravo	1.5 lbs/100 gals	7	Use higher rate for Downy Mildew.
		Maneb 75DF	1.5-2 lbs/100 gals	7	
		Maneb 80W	1.5-2 lbs/100 gals	7	
	Black Rot	See Cabbage			
	Wire Stem	See Cabbage			
Celery	Blights (*Cercospora, Septoria)*	Chlorothalonil	Mfg. label	7	1st appearance; 3 to 5 day intervals or 2 to 3 pts on a 7 day schedule
		Fixed Copper See appendix.	Mfg. label	0	1st appearance; 5 to 7 day intervals.
		Quadris	9.2-15.4 ozs/A		7 to 14 day intervals. Alternate with other fungicides.
	Bacterial Blight	Fixed Copper See appendix	Mfg. label	0	1st appearance; 5 to 10 day intervals.
	Damping Off	Ridomil-Gold	1-2 pts/A	21	Band application at planting.
	Downy Mildew	Aliette WDG	2-5 lbs/A	3	7 to 21 day intervals.
Collard	Downy Mildew	Aliette WDG	2-5 lbs/A	3	7 to 21 day intervals.
	Black Rot	Fixed Copper See appendix.	Mfg. label	0	7 to 21 day intervals. Adjust pH of spray to 6.5-7.
	Wire Stem	See Cabbage			
Corn (sweet)	Blights	Chlorothalonil	Mfg. label	14	1st appearance; 10 to 14 day intervals. Do not feed forage to dairy animals being furnished for slaughter.
		Quadris	6.2-15.4 ozs/A	1	Do not feed treated forage to livestock.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Corn (sweet) (cont'd.)	Rust	Dithane F-45	1.2 qts/100 gals	7	1st appearance; 10 to 14 day intervals. Do not feed forage to diary animals being furnished for slaughter.
Cucumber	*Alternaria* Leaf Spot Anthracnose Cercospora Leaf Spot Downy Mildew Cercospora Target Spot	Aliette	2-5 lbs/A	0	Aliette for Downy Mildew. Maneb for Alternaria.
		Aliette/Maneb	4 lbs/A	5	
		Chlorothalonil	Mfg. label	0 0	1st appearance; 7 to 10 day intervals.
		Fixed Copper See appendix	Mfg. label	0	Repeated application of copper may cause burning.
		Maneb 80	1.5-2 lbs.	5	
		Mancozeb	1.5-3 lbs/A	5	Alternate with other fungicides.
		Quadris	11-15.4 ozs/A	1	For Downy Mildew only.
		Ridomil Gold-MZ	1.5-2 lbs/100 gals	5	Do not apply more than 20 lbs/A. 14 day intervals.
		Ridomil Gold-Bravo	2-3 lbs/100 gals		
		Topsin M 70W	.25 + .5 lb/100 gals		Not for Alternaria
	Damping Off *Pythium* sp.	Ridomil Gold	1-2 lbs/treated A	-	At planting.
	Fruit Rot (Belly Rot)	Chlorothalonil	Mfg. label	0	Apply when plants start to run. Soil treatments, apply at layby when vines begin to run. Treat only once
	Angular Leaf Spot	Fixed Copper See Appendix.	Mfg. Label	0	1st appearance; then alternate with other organic fungicides recommended for cucumbers.
	Bacterial Wilt	Insecticides to control cucumber beetles		-	See Insect Control Guide.
	Gummy Stem Blight Scab	Chlorothalonil (see above)	Mfg. Label	0	Begin when plants start to run and repeat at 5- to 7- day intervals.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Cucumber (cont'd.)	Powdery Mildew	Chlorothalonil (See above)	Mfg. Label	0	1st appearance; 7- to 10-day intervals.
Eggplant	Anthracnose Early Blight Late Blight	Maneb 80	1.5-2 lbs/A	5	7- to 10-day intervals.
		Fixed Copper See appendix.	Mfg. Label	5	7- to 10-day intervals
		Cabrio	16 ozs/A	0	
		Quadris	6-15 ozs/A	0	Alternate with other fungicides.
Garlic	Downy Mildew Purple Blotch (*Alternaria)*	Chlorothalonil	Mfg. Label	7	
		Ridomil Gold-Bravo	2 lbs/A	7	14-day intervals.
		Ridomil Gold-Cabrio	1-12 ozs/A	7	14-day intervals.
		Copper	2 lbs/A	7	No more than 6 applications.
		Dithane DF, F-45, or M-45	Mfg. Label	7	Seven day interval.
		Quadris	6.2-15.4 ozs/A	1	Use higher rates for Downy Mildew. Alternate with other fungicides.
	White Rot	Rovral 50WP Botran 75W	4 lbs/100 gals		Apply in-furrow at planting. Make foliar Application once.
	Damping Off *Pythium* sp.	Ridomil Gold	.5-1 pt/A	-	Surface application.
Leafy Vegetables	*Alternaria* Leaf Spot *Cercospora* Leaf Spot Down Mildew	Quadris	6.2-15.4 ozs/A	1	Crops included on label are arugula, celery, chervil, coriander, cress, endive, fennel, lettuce, parsley, rhubarb, spinach and Swiss chard.
		Aliette	2-5 lbs/A	3	7-21 day interval.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Leek	Downy Mildew Purple Blotch	Chlorothalonil	Mfg. label	14	Do not apply more than 3 times.
		Ridomil Gold-Copper	2 lbs/A	7	14 day intervals.
		Ridomil Gold-Bravo	2 lbs/A	7	14 day intervals.
		Cabrio	8-12 oz/A	7	14 day intervals.
Lettuce	Drop (*Sclerotinia*)	Botran 75WP	2.5 lbs/125 gals	14	1st appearance; 7 to 10 day intervals.
		Quadris	6.2-15.4 ozs/A	1	
		Rovral 50WP Iprodione	1.5-2 lbs/A Mfg. label	14	1st appearance; do not make more than 3 applications per year.
	Damping Off	Ridomil Gold	1-2 pts/treated A	-	May be banded or injected at planting.
	Downy Mildew	Aliette	2-5 lbs/A	3	7-21 day intervals.
Mustard Greens	Downy Mildew	Aliette	2-5 lbs/A	3	7-21 day intervals.
	Black Rot Leaf Spot *(Alternaria*)	Fixed Copper (Kocide 2000, Kocide DF)	Mfg. label	0	7 to 10 day intervals. Excess copper may burn foliage.
	Downy Mildew	Aliette	2-5 lbs/A	3	Maximum 7 sprays.
Okra	Powdery Mildew	Quadris	6.2-15 ozs/A	0	Make no more than 2 applications.
Onions	Leaf Blast (*Botrytis)*	Aliette	2-3 lbs/A	7	Aliette for Downy Mildew only.
	Purple Blotch (*Alternaria)* Downy Mildew	Chlorothalonil	Mfg. label	14	For Botrytis only. Do not apply more than 3 times per season. Do not apply to sweet Spanish onions.

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Onions (cont'd)		Cabrio	8-12 ozs/A	7	7 day interval.
		Fixed Copper	Mfg. label See appendix.	0	7 to 10 day intervals.
		Maneb 80	2-3 lbs/A	7	
		Mancozeb	2-3 lbs/100 gals	7	7 day intervals.
		80WP	2-3 lbs/100 gals	7	14 day intervals.
		Quadris	6.2-12.3 ozs/A		Use higher rate for Downy Mildew. Alternate with other fungicides.
		Ridomil Gold-MZ	2 lbs/100 gals	14	Downy Mildew only. Do not apply more than 12.5 lbs/A.
		Ridomil Gold-Bravo	2 lbs/100 gals	7	14 day intervals. Don't spray more than 4 times per season.
		Ridomil Gold-Copper	2 lbs/A	7	14 day intervals
		Rovral 4F	1.5 lbs/A	7	7 day intervals.
		Iprodione	1.5 pts/A	7	14 day intervals.
	Damping Off (*Pythium*)	Ridomil Gold	.5 – 1 pt/A		May be applied in band or pre plant incorporated.
	White rot	Thiophanate Methyl	0.5 lb/1000 ft of row		Apply in furrow at planting.
Peas (English)	Powdery Mildew	Sulfur WP	4-7.8 lbs/100 gals	0	1st appearance; 7 to 10 day intervals. Do not apply when temperature is above 90 degrees F.
		Fixed Copper	Mfg. label See appendix	0	7 day intervals.
	Damping Off (*Pythium*)	Ridomil Gold	.5-1 pt/A	0	Preplant incorporated or surface application.
Peas (Southern)	See Beans				
	Viruses				Do not save seed. Use resistant varieties or western-grown seed.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Pepper	Bacterial Spot (Field)	Fixed Copper	Mfg. label See appendix	0	1st appearance; 5 – 10 day intervals. Obtain new seed source. Avoid overhead irrigation if Bacterial Spot is present.
		Fixed Copper + Maneb Tank Mix See appendix for list of fixed copper products.	Mfg. label Copper to Maneb Mix is 2-1 ratio.	7	Allow mixture to agitate for 90 minutes before using.
	Bacterial Spot (Plant bed)	Fixed Copper See appendix.			Obtain seed grown in areas free of the organism.
	Pythium sp. *Phytophthora* sp.	Ridomil Gold	1 pt/100 gal	7	Apply in 18" band at planting or as postdirected spray to lower 1/3 of plant.
		Ridomil Gold-Copper	2.5 lbs/A	7	Foliar application 10 to 14 day intervals.
	Anthracnose Cercospora Leaf Spot Phytophthora Blight	Cabrio	8-12 ozs/A	0	Do not make more than 2 sequential applications. Do not exceed 18 pounds product per season. Alternate with other fungicides.
		Maneb 75DF	1.5-3 lbs/A	7	
		Maneb 80W	1.5-3 lbs/A	7	
		Flint	1.5-2 ozs/A	3	
		Quadris	6.2-15 ozs/A	14	
	Blossom End Rot	Calcium nitrate	5 lbs/100 gals	-	Blossom end rot can result from excess nitrogen, improper balance and low calcium level. Spray at first symptoms and 2 to 3 times at 7 day intervals.
		Calcium Chloride	5 lbs/100 gals	-	
	Southern Blight	Terraclor 4F	4.5 pts/100 gals	-	At transplanting. Use .5 pt of solution per plant. Apply in-furrow at planting.
		Terraclor 4F	1.2–1.8 gals/A/100 gals		
		Terraclor 75W	3 lbs/100 gals		
	Bacterial Soft Rot	Agclor 310	100-135 ppm		In wash water.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Pepper (cont'd.)	Viruses (Insect transmitted)	Aluminum surfaced file mulches			Use of polyethylene or polyethylene coated paper mulches sprayed with aluminum paint has been effective in reducing virus diseases. This reflective surface will repel aphids that transmit viruses. NOTE: Paper mulches should be used where nutgrass is a problem.
Potato (Irish)	Early Blight Late Blight	Chlorothalonil	Mfg. label	0	1st appearance; 7-10 day intervals. Late blight use only certified seed. Do not graze treated areas after treatment with Triphenyl Tin.
		Fixed Copper See appendix	Mfg. label	0	7 to 10 day intervals.
		Maneb 80	1.5-2 lbs/A	14	
		Mancozeb	1-2 lbs/A	14	
		Quadris	6.2-15.4 ozs/A	1	Alternate with other fungicides. 7 to 14 day intervals. Use higher rates under severe disease conditions.
		Headline	12 ozs/A	3	
		Ridomil Gold-MZ	1.5-2 lbs/A	7	7 – 10 day intervals. For Late Blight only.
		Ridomil Gold-Copper	1.5-2 lbs/A	7	14 day intervals.
		Ridomil Gold-Bravo	2 lbs/A	7	14 day intervals.
		Rovral	1.5-2 lbs/A	14	7 to 14 day intervals.
		Iprodione	1-2 pts/A	14	
	Ring Rot	None		-	Use certified seed and a 3 year rotation. Discard damaged or decayed seed pieces.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Potato (Irish) (cont'd.)	Speckle Leaf	None	None	-	Ozone injury-occurs as potatoes near maturity. LaChipper is highly resistant.
	Damping Off *Pythium* sp.	Ridomil Gold	1 – 2 pts/A 2 – 4 lbs/A	-	Preplant incorporated or surface applied. See label.
Pumpkin	*Alternaria* Leaf Spot	Aliette WPG	2-5 lbs/A	1	Aliette for Downy Mildew only.
	Anthracnose	Aliette/Maneb	4 lbs/A	5	7 to 10 day intervals.
	Downy Mildew	Chlorothalonil	Mfg. label	0	Not for *Alternaria.*
		Fixed Copper[9]	Mfg label	0	1st appearance; 7 to 10 day intervals.
		Maneb 80	1.5-2 lbs/A	5	
		Thiophanate-Methyl	.25 – 5 lb/100 gals	0	For Anthracnose only.
		Ridomil Gold-Bravo	2-3 lbs/A	0	Alternate with other fungicides.
		Quadris	11 – 15.4 ozs/A	1	Alternate with other fungicides
		Cabrio	12-16 ozs/A	0	Alternate with other fungicides.
	Powdery Mildew	Thiophanate Methyl	.25-5 lb/100 gals	0	7 to 10 day intervals.
		Ridomil Gold-Copper	2 lbs/A	5	
		Procure 50W	4-8 ozs/A	1	7 to 10 day intervals.
Shallots	Purple Blotch (*Alternaria)*	Dithane	3 lbs/A	7	7 day intervals.
	Botrytis Blight	Chlorothalonil	Mfg. label	14	7 to 10 days. Do not apply more than 3 times.
		Quadris	6.2-12.3 ozs/A	1	Use higher rates on Downy Mildew. Alternate with other fungicides.
		Cabrio	8-12 ozs/A	7	Alternate with other fungicides.
	Downy Mildew	Ridomil Gold-MZ	2.5 lbs/A	7	14 day intervals.
		Ridomil Gold-Bravo	2 lbs/A	7	14 day intervals.
		Ridomil Gold-Copper	2 lbs/A	7	14 day intervals.

Vegetable Diseases

Crop	Disease	Fungicide	Rate	Min Days To Harvest	Remarks
Spinach	Damping Off (*Pythium)*	Ridomil Gold	1-2 pts/A	21	Apply in 7" band or preplant incorporated.
	Downy Mildew	Aliette	2-5 lbs/A	3	Maximum of 7 applications per season.
		Ridomil Gold-Copper	2.5 lbs/A		Mfg. label.
		Fixed Copper See appendix	Mfg. label.	0	7 to 10 day intervals. May cause flecking on spinach leaves.
	General use	Trilogy	1-4 qts	0	Toxic to bees
	White Rust	Aliette	2-5 lbs/A	3	Maximum of 7 applications per season.
		Ridomil Gold	.5-1 pt/A	21	Use as additional application 40-50 days after planting – shanked in.
		Ridomil Gold Copper	2.5 lbs/A	21	Mfg. label.
Squash	Angular Leaf Spot	Fixed Copper See appendix	Mfg. label	0	1st appearance; 7-10 day intervals. Maximum of 4.4 lbs/A.
	Anthracnose Downy Mildew Powdery Mildew	Aliette DWG	2-5 lbs/A	1	Do not exceed 7 applications per year.
		Aliette/Maneb	4 lbs/A	5	Do not exceed 7 applications per year.
		Fixed Copper	Mfg. label	0	1st appearance; 7 to 10 day intervals.
Squash		Maneb 80	1.5-2 lbs/A	5	
		Mancozeb	2-3 lbs/A	5	Alternate with other fungicides.
		Quadris	11-15.4 ozs/A	1	
		Ridomil Gold-MZ	1.5-2 lbs/A	5	14 day intervals
		Ridomil Gold-Bravo	1.5-2 lbs/A	5	
		Thiophanate Methyl 70W	.25-5 lb/A	0	Not for Downy Mildew
	Damping Off (*Pythium)*	Ridomil Gold	1-2 pts/A	-	Preplant incorporated or surface application.

Commercial Vegetables

Variety	Rhizopus Soft Rot	Root Knot Nematode	Soil Rot	Fusarium Wilt	Sclerotial Blight	Fusarium Root Rot	Bacterial Root Rot	Internal Cork
Beauregard	R	S	R-I	R	I	R	S	R
Bienville	R	R	R	R	-	R	R-SI	R
Centennia l	-	S	S	I-R	I-S	I	R	I
Excel	-	R	I-S	R	I	R	I	R
Hernandez	I-S	R-I	R-I	I-R	-	I	R	R
Jewel	I	R	S	R	I	I	I	R
Porto Rico (Unit 1)	-	I-S	S	S	S	R-I	R	S
Resisto	-	R	S	R	S	-	R	R
L96-117	I	R	R	I	-	I-R	R	

S = Susceptible
R = Resistant
I = Intermediate

Commercial Vegetables

Crop	Disease	Chemical & Formulation	Rate of Formulated Material	Min. Days to Harvest	Remarks
Sweet Potatoes (cont'd)	Scurf	Mertect 340F	8 ozs/7.5 gals (dip)	-	Leave in solution 1-2 minutes.
	Rhizopus Soft Rot	Bortran	1 lb/100 gals water	-	Spray after washing while potatoes are on conveyor or rollers
	Soil Rot	None			Maintain soil pH below 5.2. Use resistant varieties.
Tomato	Athracnose Early Blight Gray Leaf Spot	Bravo	Mfg. Label.	0	1st appearance; 5- to 10- day intervals. Can use up to 3 pts Bravo on Fruit Rot.
		Ridomil Gold-Bravo Mancozeb	2 lbs/100 gals	7	
		Maneb 80 Fixed	1.5-2 lbs/A	5	14-day intervals.
		Copper (see	1.5-2/lbs/A	5	Rotate with other
		appendix)	Mfg. Label	0	fungicides 7- to 10-day intervals
		Soil Rot Aliette/Maneb	4 lbs/A	14	7- to 10-day intervals
		Quadris	5-6 ozs/A	7	7- to 10-day intervals
		Cabrio	8-12 ozs/A	0	7- to 10-day intervals
	Bacterial Spot (Field)	Tank mix of Fixed Copper Plus Maneb 80	3 lbs. Copper & 1.5 lbs. Maneb	-	1st appearance; 5- to 10- day intervals. Bacterium is seed transmitted. Use reliable seed source. Allow mixture to agitate 90 minutes before using.
	Leaf Mold	Chlorothalonil	Mfg. Label	0	7-10 day intervals.
		Ridomil Gold - Bravo	2 lbs/A	14	10- to 14-day intervals. 1st appearance; 5- to 10-day intervals.
	Late Blight Buckeye rot	Ridomil Gold MZ Ridomil Gold Bravo	2.5 lbs/100 gals 2 lbs/A	0 7	14-day. Rotate fungicides.

Crop	Disease	Chemical & Formulation	Rate of Formulated Material	Min. Days to Harvest	Remarks
Tomato (cont'd)	Tobacco Mosaic Virus				See section on seed treatment. Tomato stakes to be reused should be treated to destroy viruses. Soak stakes in a 1% formaldehyde solution for 5 minutes. Use 1 gallon of 37.5% formaldehyde, mixed with 50 gallons of water in a 55-gallon drum. Stakes can also be steam treated or boiled for 15 minutes.
	Viruses (Insect transmitted)				See Peppers.
	Fusarium Wilt Verticillium Wilt	Chloropicrin	6-8 gals/A (row) 3-4 cc/sq ft	-	2 to 4 weeks before setting in warm soil. Use resistant varieties. See Vegetable Planting Guide.
		Terr-o-gas 67	225-325 lbs/A		Preplant only. Aerate 2 weeks before setting transplant in treated
Tomato (Greenhouse)	Bacterial Leaf Spot	Fixed Copper	Mfg. Label	0	Excessive use of copper fungicides may cause phytotoxicity.
	Gray Mold	Exothern/Termil	100 gm can/100 sq ft of greenhouse	0	7-day intervals. DO not apply to wet foliage.
	Leaf Mold	Maneb	1.5-2 lbs/100 gals	5	Do not use Maneb on young seedlings.
	Botrytis Stem Rot	Botran	1 lb/A	14	Spray stems up to 24 inches high.

Commercial Vegetables

Crop	Disease	Chemical & Formulation	Rate of Formulated Material	Min. Days to Harvest	Remarks
Turnip Greens	Black Rot Alternaria Leaf Spot	Kocide 2000	.75-1.5 lbs/A	0	7-to 10-day intervals.
	Downy Mildew	Kocide DF	1-2 lbs/A	0	7- to 10-day intervals. Do not apply coppers in a spray solution having a pH of less than 6.5 or burning may occur.
	Cercospora Leaf Spot Powdery	Quadris	6.2-15.4 ozs/A	1	7- to 14-dat intervals. Alternate with other fungicides.
	Mildew *Alternaria* Leaf Spot	Cabrio	8-12 ozs/A	0	7-14 day interval. Maximum 3 applications per season.
	General use	Triology	1-4 qts	0	Toxic to bees
Watermelon	Anthracnose Gummy Stem Blight Downy Mildew	Aliette/Maneb	4 lbs/A	5	7-to 10-day intervals. 1st appearance; 7- to 10- day intervals. 5- to 7-day intervals.
		Chlorothalonil	Mfg. Label	7	Use higher rate of Bravo for Gummy Stem Blight. 14-day intervals.
		Maneb-80	Mfg. Label		
		Mancozeb	Mfg. Label		7-10 day intervals.
		Dithane	Mfg. Label		7-10 day intervals.
		Cabrio	8-16 ozs/A	0	7-10 day intervals
		Quadris	11-15.4 ozs/A	1	Alternate with other fungicides for both Cabrio and Quadris
		Fixed Copper (See appendix)	Mfg. Label		
	Damping Off *Pythium* sp.	Ridomil Gold	1-2 pts/A	-	Preplant incorporated or surface application.
	Downy Mildew	Aliette	2-5 lbs/A	0	7- to 10-day intervals.
		Ridomil Gold MZ	1.5-2 lbs/A	5	For Downy Mildew only.
		Ridomil Gold-Bravo	1.5-2 lbs/A	5	Do not apply more than 20 lbs/A.

Commercial Vegetables

Crop	Disease	Chemical & Formulation	Rate of Formulated Material	Min. Days to Harvest	Remarks
Watermelon (cont'd)	Powdery mildew	Nova 40W	2.5-5 ozs/A	0	7-10 day interval.
		Procure 50W	4-8 ozs/A	1	7-14 day interval.
	Fusarium Wilt	None		-	Use resistant varieties.

Nematode Control

Field Crops

All crops grown in Louisiana are subject to some type of nematode attack. Some nematodes such as root-knot or cyst may be very damaging but others such as stunt or spiral may not. Different crops or even varieties may differ in their response to various nematodes. Chemical control should be used if a nematode population appears to be at damaging levels and is likely to cause significant yield loss.

Crop	Chemical	Rate of Form Material/A	Remarks
Cotton			
	Telone II	3-5 gals/A	Apply fumigant 2-3 weeks before planting to at least 12 inches beneath the soil surface of the row. Soil should not be excessively wet at the time of application.
	Temik 15% CP Temik 15G Lock 'n Load Temik 15%G	3.5-7 lbs. 5-7 lbs./a	Apply in-furrow at time of planting. Sidedress at first squaring.
	Vydate C-LV (Oxamyl)	8.5-17.0 fl ozs/A	Apply at 5-7 true leaf stage and a second application 7 to 14 days later. Application must follow in-furrow treatment of Temik 15G. For reniform nematode suppression.
Corn	Mocap 15%G (Ethoprop)	6.6 lbs/A (40" rows)	Six-seven inch band.
	Mocap EC	2.4-2.9 ozs/1000 row ft	Apply in 1 12 to 15 inch band and incorporate with top 2 to 4 inches of soil.
	Counter CR Counter 15%G Lock 'n Load	6 ozs/1000 ft 8 ozs/1000 ft	Apply in 7 inch band directly behind planter shoe in front of the press wheel. Apply in furrow.
Grain Sorghum	Temik 15% CP or Temik 15G Lock 'n Load Temik 15%G	7 lbs	Apply granules in seed furrow and cover with soil.
Grain Sorghum (cont'd)	Counter CR or Counter CR Lock 'n Load	5.2 ozs/1000 ft 7 ozs/1000 ft	Apply in a 7 inch band or in-furrow.

Nematode Control

Field Crops

Crop	Chemical	Rate of Form Material/A	Remarks
Peanuts	Temik 15% CP or Temik 15G Lock 'n Load Temik 15%G	14-20 lbs/A (row)	Apply granules in 6 to 12 inch band and work in soil to a depth of 2 to 4 inches.
	Nemacur 15%G	10-17 lbs/A (row)	Apply in a 12 inch band. Incorporate into soil.
	Nemacur EC	2-3.3 qts/A	Apply in a 12 inch band. Incorporate into soil.
	Mocap 15%G	13-26 lbs/a	
	Mocap EC	2.9-5.9 ozs/1000 row ft	Apply in a 12 inch band. Incorporate into soil.
	Vydate C-LV	34-102 fl ozs/A	Apply in a 7 to 12 inch band using a minimum of 10 gals/A.
	Vydate L	2-4 pints/A	Apply as a foliar application 3 weeks after emergence and again at 6 weeks.
Soybean	Temik 15% CP or Temik 15G Lock 'n Load Temik 15%G	10-20 lbs	Apply in 6 to 8 inch band at planting. Incorporate to a depth of 2 to 4 inches.
	Vydate C-LV Vydate L	17-34 fl ozs/A 2-4 pts/A (36" row)	Spray over open drill row or in a 7 to 10 inch band.
Sugarcane	Temik 15% G Lock 'n Load Temik 15%G	14-20 lbs/A	Apply granules in open row on top of newly planted cane. Cover immediately with at least 6 inches of soil

Nematode Control

Field Crops

		Rate of Form	
Crop	**Chemical**	**Material/A**	**Remarks**
Sugarcane (cont'd)	Mocap 15%G Mocap 20%G	13-26 lbs/a 10-20 lbs/A	Apply over seed pieces in the opening furrow. Cover with at least 6 inches of soil.
	Mocap EC	5-11.8 ozs/1000 ft	Apply in 12 to 15 inch band and cover.
Tobacco	Nemacur EC	1.3-2 gal/a	Broadcast and incorporate
	Mocap 15%G Lock 'n Load	3.2-6.4 lbs/1000 ft.	Mix with upper 2-4 inches of soil.
	Mocap EC Telone C-17 or C-35	10.3-20.6 oz/1000ft FOLLOW MANUFACTORS RATES	Apply in a 18-24 inch band.
	Vydate C-LV	68 fl. Oz/A	Apply in a 18-24' band.

Nematode Control

Fruit

Crop	Chemical	Rate of Form Material/A	Remarks
Blackberries, Boysenberries, Dewberries, Rasberries &	Telone II	27-35 gals/A broadcast	Apply 14 days prior to planting. Row treatment: Use 2 chisels spaced 12 inches apart per row. Inject chemical to a depth of 10 inches.
	Telone C-17	95.3-123.5 fl oz/1000 ft	
Strawberries	Telone EC	9-24 gal/a (broadcast rate)	Apply with drip irrigation equipment.
	Telone C-35	39-50 gal/a (broadcast rate)	Inject 12-14" beneath row.
Strawberries	Methyl bromide + Chloropicrin	Follow mfg. label.	Soil application. Apply the material under a tarp. Aerate after 48 hours by making holes where plants will be placed. Apply in 12" band.
	Nemacur 15%	14.7-22 oz for any row spacing	Apply in 12-18 inch band and incorporate.
	Nemacur 3	5.9-8.8 fl oz for any row spacing	
Fruit tree sites (preplant)	Brom-O-Gas	1-2 lbs/100 ft	For nursery use only. Soil application. Apply the material under a tarp. Remove tarp after 48 hours and aerate two weeks prior to planting. Deep injection auger-probe treatment. Depth of 24 to 36 inches. After treatment, tamp or compact soil at the point of injection.
	Vapam HL	37.5-75 gal/A	Apply by chemigation
	Telone II	79-103 ozs/1000 ft row	Waiting period required.
	Telone C-17	Follow mfg. label.	
	Telone C-35	39-50 gal/A	Waiting period of 1 week for every 10 gal applied.
Citrus	Nemacur 3	1.66-2.5 gal	Band and incorporate either mechanically or with irrigation.
	Temik 15% G Temik G CP	33 lbs/A	For oranges, grapefruit and lemons only. Apply prior or during spring flush.
	Vydate L	3-4 gals/A	NON-BEARING TREES ONLY. Preplant or postplant.
	Ditera DF or ES	13-100 lbs/A 10-40 gal/A	

Nematode Control

Fruit

		Rate of Form	
Crop	**Chemical**	**Material/A**	**Remarks**
Peach, Pear, Apple	Vydate L	3-4 gals/A	Apply in 20 gals of water and incorporate 4 to 8 inches. USE ON NON-BEARING TREES ONLY.
	Ditera DF or ES	13-100 lbs/A 10-40 gal/A	Preplant or postplant.
Grapes	Nemacur 3	1-2 gals/A (band)	Apply in 10 gals of solution and incorporate mechanically or by irrigation.
		2 qts – 1 gal/A	Low pressure irrigation.

Nematode Control

Ornamentals

Crop	Chemical	Rate of Form Material/A		Remarks
Field or Commercial	Methyl bromide + Chloropicrin	300-350 lbs/A weeks)	Preplant (2	This treatment is effective against nematodes and other soil-borne pests. Treated area must be immediately covered with a plastic film. A mechanical applicator and plastic tarp layer is available for seedbed and field treatment. FOLLOW MANUFACTURER'S INSTRUCTIONS.
	Telone II	42-55 gals/A (broadcast)	Preplant (2 weeks)	FOLLOW MANUFACTURER'S INSTRUCTIONS.
	Telone C-17	Follow mfg. label		
	Telone C-35	60-79 gals/A		Wait at least 1 week for every 10 gals applied before planting.
	Ditera DG or ES	13-100 lbs/A (broadcast) 10-40 gal/A		Apply preplant, at plant or post plant. Multiple applications may be required.
	Vapam HL	37-75 gals/A		Tarping may be used to prevent fumigant escape.
	K-Pam HH	30-60 gal/a		Apply and cover for best results.
	Pylon	5.2 – 10 fl. oz/100 gal		For foliar nematode. Make first application at first signs of damage and second at 7-14 days.

Nematode Control

Turfgrass

Time of Application	Nematicide	Rate	Remarks
Preplant	Methyl bromide + Chloropicrin	1.5-3 lbs/100 sq ft	Inject chemical to a depth of 5 to 8 inches below soil surface. Use an airtight cover. Do not treat soil if temperature is below 45 degrees F at the 5 inch level.
Post plant	Nemacur 10% granules	2.33 lbs/1000 sp ft	FOLLOW MANUFACTURER'S INSTRUCTIONS.
	Nemacur 3 Turf Nematicide	9.7 fl ozs/1000 sq ft	Apply in at least 20 gals/A of water rate. Use a coarse spray directed at turfgrass surface.

Nematode Control

Commercial Vegetable Crops

Crop	Chemical	Rate of Form Material	Remarks
Beans (Snap & Lima)	Mocap EC Mocap 15G	2-3.9 ozs/1000 row ft 13-20 lbs./a	Apply in a 12 to 15 inch band.
Cabbage	Ditera ES	10-40 gals/A (broadcast)	Apply replant and/or in multiple applications.
	Mocap EC	2.4 ozs/1000 row ft	Apply in a 15-inch band. Do not use a see furrow treatment or allow granules to contact the seed.
	Mocap 15% G	0.9 lbs/1000 row ft	Apply in 12- to 15-inch band.
	Nemacur 15%G	7.3-18.4 ozs/1000 ft	Apply in a 6- to 15- inch band. Incorporate mechanically or irrigate overhead.
Carrots	Vydate L	1-2 gals in-furrow	Use a minimum of 20 gallons of water.
Cole crops (broccoli, cabbage, cauliflower)	Ditera DG Ditera ES	13-100 lbs/A 10-40 gals/A broadcast	Apply preplant and incorporate.
Cucumbers	Mocap 15%G	13 lbs/A	Apply in a 12- to 15-inch band across the row. Mix with the top 2 inches of soil.
	Mocap EC	5.3 ozs/1000 row ft	Apply in a 12 – to 15-inch band across the row. Mix with the top 2 inches of soil.
Cucurbits (cucumbers, melons, squash, pumpkins, etc.)	Vydate L	1-2 gals/A (broadcast)	Incorporate 2- to 4-inches
	Vydate L	2-4 pints/A	Foliar spray 2- to 4-weeks after planting and 2- to 3-weeks after first spray.
Eggplant	Vydate L	1 gal in band 4 pints foliar	Apply in a band 2- to 3-weeks after transplanting and again 4-weeks later.
	Nemacur EC	2.66 qts/A	Apply in a 12-inch band and incorporate.

Nematode Control

Commercial Vegetable Crops

Crop	Chemical	Rate of Form Material	Remarks
Irish Potatoes			Apply in a 12-inch band and incorporate. Avoid direct application in the seed furrow.
	Mocap 15%G	40-80 lb/a	
	Mocap EC	4.4 ozs/1000 row ft	
	Vydate L	1-2 gals/A	Apply in-furrow with a minimum of 20 gallons of water
	Vydate C-LV	4.2-8.4 pints/a	
Okra	Nemacur 15% G	12-15 lbs/A (40" row)	Apply in a 12- to 15-inch band and incorporate to a depth of 2- to 6-inches.
Pepper	Vydate L	2 pts/A (transplant water)	Add material to transplant water and use a minimum of 200 gallons of water.
	Vydate L	2-4 pts/A (foliar treatment)	Uses the foliar treatment also for heavy infestations of nematodes
	Methyl bromide + Chloropicrin	Follow mfg. Label.	
Sweet Potatoes			
	Mocap 15%G	20-26 lbs/a	Apply in 12-15" band
	Mocap EC	5.1-6.9 oz/1000 row ft	
	Vydate L	2-3 gals/A broadcast 1-2 gals/A in-furrow	Apply within a week of planting Apply during planting of slips.
	Temik 15%G CP or Temik 15G Lock 'n Load	10-20 lbs/A	Apply in 12- inch band in opened row. Cover immeadiately with soil by hilling 8 to 10 inches.
	Temik 15%G		
Sweet Corn	Counter 15G Lock 'n Load	6-8ozs/ 1000 row ft 4.5-6 oz/1000 row ft	Apply in-furrow
	Counter CR	2.4-2.9 ozs/1000 row ft	
	Mocap EC		Apply in 12- to 15-inch band on the row and incorporate
	Mocap 15%G	0.75-1 lb/1000 row ft	Apply 12- to 15-inch band. Incorporate to 2 to 4 inches
Tomatoes	Methyl bromide + Chloropicrin	350 lbs/A	Wait at least 2 weeks before planting transplants
	Vydate L	2-4 pts/A	Add to 100 gallons of water. Treat every 1 to 2 weeks throughout the season.
Vegetables (general)	Telone II	26-35fl ozs/1000 row ft	Apply 2 to 3 weeks prior to planting.
	Telone C-17	31.8-50 fl ozs/1000 row ft	

Nematode Control

Commercial Vegetable Crops

		Rate of Form	
Crop	**Chemical**	**Material**	**Remarks**
Vegetable (general)	Telone EC	9-18 gals/a (broadcast)	Use with drip irrigation and reduce rate to match row width
	Telone C-35	13-20.5 gal/a (broadcast)	Inject 12-14” beneath the row
	Vapam HL	37.5- 75 gal/a	Inject and tarp.

Nematode Control
Home Gardens

Root-knot and reniform nematodes cause problems on many vegetables. Cultural practices and resistant varieties can reduce the amount of damage in the garden.

Cultural Controls

1. Plant early before nematodes get active in soil.
2. Rotate crops in the garden
3. Rotate the garden site each year
4. Add organic matter to the soil in the form of green manures or mulches to stimulate natural enemies of nematodes and improve growing conditions within the soil for plants.
5. Use fallow plowing during parts of the summer to reduce nematode levels.
6. Keep the garden clean of weeds and grasses, which serve as natural hosts for nematodes.
7. Keep soil fertility levels high, and have the soil pH in the correct range for your soil type.
8. Provide extra water during prolonged dry spells.
9. Remove crops immediately after they are through producing, especially the roots.
10. Most of the marigolds (except Signet types) are effective trap crops against root-knot nematodes. Plant the marigolds solid for at least 2 to 3 months and then plant vegetables.

Resistant Varieties or Crops

Root-knot resistant varieties include:

<u>Tomatoes</u>- Better Boy, Celebrity, Terrific, Champion, Monte Carlo, Summer Flavor 6000, Big Beef, First Lady, Carmella, Small Fry, Sweet Chelsea, Big Beef, Hawaiian Hybrid, Bingo, Carnival, and Floramerica, and Spring Giant.

<u>Southern Peas</u>- Mississippi Silver, Mississippi Purple, and Magnolia.

Resistant crops against reniform include broccoli, cauliflower, corn, okra, onion, peanut, radish and turnip.

Seed treatment is the cheapest insurance a grower can buy for obtaining a desirable crop stand. Although seed treatment will not make poor seed germinate, when the correct treatment is used on certified seed, it will usually prevent seed decay and seedling blights. Seed treatments may act in two ways. First, they will usually kill parasites on the seed, and second, they help protect the seed and seedlings from organisms in the soil. **Never use treated seed for food, feed or oil purposes.**

Crop	Chemical	Rate of Formulated Material (ozs/cwt)	
		Machine Delinted	Acid Delinted
Cotton	Captan 75	3	2
	Demosan 65 + TCMTB 30	10 + 6	10 + 5
	Demosan 65 + Captan 75	10 + 3	10 + 2
	Demosan 65 + Terracoat L-21	10 + 16	10 + 12
	Demosan 65 + Thiram (70%)	10 + 3	10 + 3
	Terracoat L-21	16	12
	Terracoat L-205	16	12
	Thiram 42S	4.5	4.5
	Vitavax 30C + Captan 75	3.3 + 3	3.3 + 2
	Vitavax 30C + Thiram 70%	3.3 + 4.5	3.3 + 4.5
Peanuts	Botran + Captan Captan + Maneb Terracoat – SC 205	According to mfg. Label	
Soybeans (Hopper Box Dusts)	Thiram Arasan 50R Moly-T	 2 ozs/cwt 4 ozs/bu	
	Captan [1] Captan 25 Captan 25 + MO Ortho Soybean Seed Protectant Ortho Soybean Seed Protectant (MO)	 4 ozs/bu 4 ozs/bu 4 ozs/bu 4 ozs/bu	
	PCNB – Terrazole Terraclor Super-X 20-5 Terraclor Super-X with MO Terraclor Super-X with Graphite Terra-Coat SD-205	 2-4 ozs/bu 4-8 ozs/bu 4-8 ozs/bu 2-4 ozs/bu	

[1]Captan has not been as effective in light-textured soils.

For vegetable planting, always use top quality seed obtained from reliable, commercial sources. If seed has not been treated, the following treatments should be used. With all seed treatments, follow directions and safety precautions on manufacturer's label. Do not use treated seed for food or feed.

Crop	Material	Method	Rate	Diseases Controlled
Bean (lime & snap)	Captan Thiram (Arasan)	Dust Dust	½ tsp/lb 1/3 tsp/lb	Seed decay; damping off
Crucifers: Cabbage, Cauliflower, Collard, Mustard, Turnip, etc.	Buy western-grown hot water treated seed and treat with Thiram (Arasan)	Dust	2/3 tsp/lb	Black leg; black rot; seed decay; damping off
Cucurbits: Cantaloupe, Cucumber, Watermelon	Thiram (Arasan)	Dust	2/3 tsp/lb	Seed decay; damping off
Corn (sweet)	Captan Thiram (Arasan)	Dust Dust	½ tsp/lb 1/3 tsp/lb	Seed decay; damping off
Cowpeas	Captan Thiram (Arasan)	Dust Dust	½ tsp/lb 1/3 tsp/lb	Seed decay; damping off
Okra	Thiram (Arasan)	Dust	½ tsp/lb	Seed decay; damping off
Pepper	Captan [1]	Dust	1 tsp/10 lbs	For bacterial spot control, use only seed grown in the arid U.S. or seed that has been hot water treated. [2]
Potato (Irish)	Captan 7.5% Mancozeb Polyram 7% Zineb 6.5%	Dust Dust Dust Dust	1 lb/100 lb 1 lb/100 lb 1-1.5 lbs/100 lb 1 lb/100 lb	Seed piece decay. Dust seed pieces immediately after cutting.
Potato (Sweet)	Mertect 340F Botran 75WP	Dip Drench Dip	.5 pt/7.5 gal 2.3 lbs/14 gal water/100 sq ft of bed 1 lb of 7.5 gal water	Black rot, scurf and foot rot. Scurf and Sclerotial Blight Scurf and Sclerotial Blight
Tomato	Thiram (Arasan) Hydrocloric acid mixture	Dust Soak	.5 tsp/lb 1 part acid + 19 parts water	Seed decay; damping off Tobacco Mosaic Virus[3]

[1]Captan is an additional treatment for damping off and not a substitute for the above suggestions.

[2] Growers can hot water treat their own seed. Heat water in large pot to a temperature of 125 degrees F. Place seed in a loose cloth bad (cheese cloth does well). Water should circulate freely and seed should not completely fill the bad. Put seed in hot water for 30 minutes. Keep water temperature at 125 degrees F and cool quickly in running tap water. Then spread seed out to dry quickly. Caution: Do not exceed 125 degrees F during the treatment period because this will reduce germination.

[3] Tobacco Mosaic Virus is seed transmitted and easily spread from only one or two infected plants. Mix 1 part acid concentrate (37%) in 19 parts water. Soak seed in HCL solution for 5-6 hours to destroy virus. Stir occasionally. Rinse seed thoroughly in running tap water (30 minutes) or wash in 10-12 changes of water to remove acid. Dry quickly.

CAUTION: AVOID CONTACE WITH ACID MIXTURE. ADD ACID TO WATER TO KEEP FROM SPLATTERING.

Suggestions for treating procedure: Place the seed in an airtight jar or other container, spread the required amount of dust over the seed, close the lid and shake or rotate until all seed are thinly coated. Never have the container more than one-half full for any one operation.

In treating small quantities of seed, such as paper packet, tear one corner of the packet and place a pinch of the dust in the package with the seed. Shake the see and dust together for several minutes.

CAUTION: DO NOT USE TREATED SEED FOR FOOD OR FEED.

Soil Fumigants, Fungicides, Decontaminates for Greenhouses and Plant Beds

The objective of fumigating greenhouses and plant beds are the eradication of weed, nematodes, soil insects, damping off fungi and plant disease bacteria. This is critical for the successful production of greenhouse crops and healthy plants for field use. It is important to prevent the introduction of contaminated tools of soil that has not been properly fumigated after the plant beds have been treated.

Soil Fumigants			
Product	**Method of Application**	**Rate**	**Remarks**
Dichloropropene (ane) DD, Telone	Inject 4 – 6 in. deep, space chisels 12 in. apart. Cover 1 week, aerate 2 weeks	8 – 16 ozs/100 sq ft (25 – 50 gal/A)	Effective against nematodes.
Dry heat	Place small quantities in over	180 degrees F for 30 mins.	Effective against weeds, nematodes, insects, bacteria and fungi.
Methyl bromide	Release in dishes spaced 30 ft. apart under plastic cover. Fumigation period 1-2 days, aerate 1 – 2 weeks	Heat soil to 180 – 200 degrees F for 30 mins. 6 in. deep	Effective against weeds, nematodes, insects, bacteria and fungi.
Vapam	Sprinkle over the area or pour into 4- 6 in. trench dug at 12 in. centers. Apply liberal amount of water to seal chemical. Allow 3 weeks between treatment and planting.	1 pt of 32.7% in 10 gals water/100 sq ft	Effective against nematodes, soilborne fungi and many weeds.

Soil Fumigants			
Product	**Method of Application**	**Rate**	**Remarks**
PCNB + Captan (10-10 formulation)	Apply dust evenly over surface of soil and rake or rototill 2-3 inches deep prior to seeding.	2 lbs/1000 sq ft	Controls *Rhizoctonia* and *Pythium* damping off and seedling rot caused by fungi. Use only on cabbage and broccoli.
Captan 50% WP	Apply ½ gal/sq yd of bed. Make additional applications at 10-day intervals.	2 tbl/gal	Controls *Pythium* damping off. Use primarily on peppers, eggplant and tomatoes.
PCNB (Terraclor) 75% WP	Apply ½ gal/sq yd of bed. Make additional applications at 10-day intervals.	4 tbl/gal	Controls *Rhizoctonia* damping off. Used primarily on tomatoes, peppers and eggplant.
Subdue 2E	Apply 2- 4 tbl/150 sq yards of bed.	2 tbl/gal	Control *Pythium* damping off. Labeled for use on broccoli , cabbage, cauliflower, eggplant, tomatoes, cucumbers, melons, peppers and squash.

Decontaminants for Tools, Equipment, Pots and Flats			
Product	**Method of Application**	**Rate**	**Remarks**
Alochol (grain, rubbing or wood)	Dip or swab; do not rinse solution.	Not less than 70%	Controls bacteria and fungi.
Formaldehyde	37% Dip or Swab	1.0 pt/15 gal	Controls bacteria and fungi
Sodium hypochlotite 5.25% (Chlorox)	Dip 10 seconds, brush or spray, let drain. Do not rinse.	5 gals/100 gals	Controls bacteria and fungi
Methyl bromide	Cover items under airtight plastic. Release fumigant in dish.	8 – 11 lbs/1000 cu ft	Control weeds, nematodes, bacteria and fungi
LF-10	Dip or swab	Follow mfg. Label	Available from Ball Seed Co.

Appendix
Trade Names of Fungicides and Nematicides Listed Alphabetically

26GT (see iprodione)
3336 F (seethiophanate-methyl)
3336 WP (seeethiophanate-methyl)
Abound (see azoxystrobin)
Acrobat 50WP (see dimethomorph)
Actigard 50WP (see acibenzolar-s-methyl)
Agri Tin (see triphenyltin hydroxide)
Agri-Mycin 17 (see streptomycin sulfate)
Aliette WDG (see aluminum tris)
Aliette WDG Fungicide (see aluminum tris)
Amistar (see azoxystrobin)
Apron Maxx RTA (see fludioxonil/mefenoxam)
Apron Maxx RTA + Moly (see fludioxonil/mefenoxam)
Apron XL LS (see mefenoxam)
Armicarb 100 (see potassium bicarbonate)
Artisan (see flutolanil/propiconazole)
Auxigro WP (see gamma aminobutyric acid/L-glutamic acid)
Banner Maxx (see propiconazole)
Banol (see propamocarb hydrochloride)
Basic Copper 53 (see basic copper sulfate)
Bayleton 50 T&O WSP (see triadimefon)
Botran 75-W (see dichloran)
Bravo Ultrex (see chlorothalonil)
Bravo Weather Stik (see chlorothalonil)
Bravo Zn (see chlorothalonil)
Brozone (see methyl bromide 68.6% + Chloropicrin 1.4 %)
Bumper 41.8 EC (see propiconazole)
Cabrio EG (see pyraclostrobin)
Captan 50WP (see captan)
Captan 80WDG (see captan)
Captevate 68 WDG (see captan/fenhexamid)
Champ DP (see copper hydroxide)
Champ Formula 2 Flowable (see copper hydroxide)
Champion WP (see copper hydroxide)
Chipco 26019 (see iprodione)
Chipco 26019 N/G (see iprodion)
Chipco Signature (see aluminum tris)
Chloropic (see chloropicrin)
COC DF (see copper oxychloride)
COC WP (see copper oxychloride)
Compass (see trifloxystrobin)
Compass O 50 WDG (see trifloxystrobin)
Contans WG (see *Coniothyrium minitans*)
Copper Sulfate Instant Powder (see copper sulfate pentahydrate)
Cuprofix Disperss (see basic copper sulfate)
Cuprofix MZ Disperss (see basic copper sulfate/mancozeb)
Daconil Ultrex (see chlorothalonil)

Appendix
Trade Names of Fungicide and Nematicides Listed Alphabetically

Dasanit (see fensulfothion)
Ditera (see *Myrothecium verrucaria*)
Dithane-75DF Rainshield (see mancozeb)
Dithane-DF Rainshield (see mancozeb)
Dithane-F45 Rainshield (see mancozeb)
Dithane-M45 (see mancozeb)
Dividend Extreme (see difenoconazole/mefenoxam)
Dividend XL Ultra (see difenoconazole/mefenoxam)
Domark 230 ME (see tetraconazole)
Dusting Sulfur-IAP (see sulfur)
Eagle 20EW (see myclobutanil)
Eagle 40 WP (see myclobutanil)
Echo 720 Turf and Ornamental (see chlorothalonil)
Elevate 50 WDG (see fenhexamid)
Elite 45-DF (see tebuconazole)
Emerald (see boscalid)
Enable 2F (see fenbuconazole)
Endura (see boscalid)
Equus 720 SST (see chlorothalonil)
Equus DF (see chlorothalonil)
Exotherm Termil
Ferbam Granuflo (see ferbam)
Flint (see trifloxystrobin)
Folicur 3.6-F (see tebuconazole)
Fore-80WP Rainshield (see mancozeb)
Field Fume (see D-D + EDB)
Fosphite (see potassium phosphite)
Furadan (see carbofuran)
Gavel 75 DF (see mancozeb/zoxamide)
Gem (see trifloxystrobin)
Headline (see pyraclostrobin)
Helena Prophyt (see potassium phosphite)
Heritage (see azoxystrobin)
Heritage TL (see azoxystrobin)
IAP Copper Sulfur 15-25 Dust (see copper oxychloride sulfate/sulfur)
Indar 75WSP (see fenbuconazole)
Insignia (see pyraclostrobin)
Karathane (see dinocap)
Kocide 101 (see copper hydroxide)
Kocide 2000 (see copper hydroxide)
Kocide 4.5 LF (see copper hydroxide)
Kocide DF (see copper hydroxide)
Kocide-2000 (see copper hydroxide)
Laredo EC (see myclobutanil)
Laredo EW (see myclobutanil)
Liquid Sulfur Six (see sulfur)
M-Pede (see potassium salts of fatty acids)

Maneb 75DF (see maneb)
Maneb 80WP (see maneb)
Manex (see maneb)
Manex Fungicide (see maneb)
Mankocide (see copper hydroxide/mancozeb)
Manzate 75DF (see mancozeb)
Manzate Flowable (see mancozeb)
Manzate Pro-Stik (see mancozeb)
Maxim 4FS (see fludioxonil)
Maxim MZ (see fludioxonil/mancozeb)
Maxim Potato Seed Protectant (see fludioxonil)
MC-33 (see methyl bromide 67% + chloropicrin 33%)
Medallion (see fludioxonil)
Mertect 340-F (see thiabendazole)
Microthiol Disperss (see sulfur)
MilStop (see potassium bicarbonate)
Mocap (see ethoprop)
Moncut 70-DF (see flutolanil)
Mycoshield (see oxytetracycline)
Nemacur
Nordox (see cuprous oxide)
Nova 40 W (see myclobutanil)
Nu-Cop 50 WP (see copper hydroxide)
Nu-Cop 3 L (see copper hydroxide)
Nu-Cop 50 DF (see copper hydroxide)
OHP 6672 4.5 L (see thiophante-methyl)
OHP 6672 50 W (see thiophate-methyl)
Orbit (see propiconazole)
Orbit 45WP (see propiconazole)
Penncozeb 75DF (see mancozeb)
Penncozeb 80WP (see mancozeb)
Penphene (see tetrachlorothiopene)
Phostrol (see phosporous acid, mono- and dibasic sodium, potassium and ammonium)
Picfume (see chloropicrin)
Previcur Flex (see propamocarb hydrochloride)
Pristine (see boscalid/pyraclostrobin)
Procure 50WS (see triflumizole)
Propensity 1.3 ME (see propiconazole)
Propimax EC (see propiconazole)
Prostar 70WP (see flutolanil)
Quadris (see azoxystrobin)
Quilt (see azoxystrobin/propiconazole)
Quintec (see quinoxyfen)
Rhapsody (see *Bacillus subtilis* strain QST 713)
Rhapsody AS (see *Bacillus subtilis* strain QST 713)
Ridomil Gold Bravo (see chlorothalonil/mefenoxam)
Ridomil Gold EC (see mefenoxam)

Appendix
Trade Names of Fungicides and Nematicides Listed Alphabetically

Ridomil Gold GR (see mefenoxam)
Ridomil Gold MZ (see mancozeb/mefenoxam)
Ridomil Gold PC GR (see mefenoxam/pentachloronitrobenzene(PCNB))
Ridomil Gold/Copper (see copper hydroxide/mefenoxam)
Ronilan EG (see vinclozolin)
Rovral 4 Flowable (see iprodione)
Rovral 75 WG (see iprodione)
Rubigan A.S. (see fenarimol)
Rubigan A.S. Turf and Ornamental (see fenarimol)
Rubigan E.C. (see fenarimol)
Scala SC (see pyrimethanil)
Serenade ASO (see *Bacillus subtilis* strain QST 713)
Sonata (see *Bacillus subtilis* strain QST 2808)
Sovran (see kresoxim-methyl)
Spectro 90 WDG (see chlorothalonil/thiophanate-methyl)
Sporan EC (see clove oil/rosemary oil/thyme oil)
Sporax (see sodium tetraborate decahydrate)
Stratego (see propiconazole/trifloxystrobin)
Stretch (see copper hydroxide)
Strike 50 WDG (see triadimefon)
Subdue GR (see mefenoxam)
Subdue Maxx (see mefenoxam)
Super Tin 80WP Agpak (see triphenyltin hydroxide)
Super-Six (see sulfur)
Switch 62.5WG (see cyprodinil/fludioxonil)
Syllit 65W (see dodine)
System 3 Seed Treatment (see *Bacillus subtilis* strain GBO3/metalaxyl/
pentachloronitrobenzene (PCNB))
Systhane WSP (see myclobutanil)
Tanos (see cymoxanil/famoxadone)
Telone II (see dichloropropene)
Telone C-17 (see dichloropropene 85% + Chloropicrin 15%)
Temik (see aldicarb)
Terraclor 2E (see pentachloronitrobenzene(PCNB))
Terraclor 400 (see pentachloronitrobenzene(PCNB))
Terraclor 75WP (see pentachloronitrobenzene(PCNB))
Terraclor Flowable (see pentachloronitrobenzene(PCNB))
Terraclor Super X (EC) (see etridiazole/pentachloronitrobenzene(PCNB))
Terraguard 50W (see triflumizole)
Terrazole 35% Wettable Powder (see etridiazole)
Terr-O-Cide 15D (see D-D 85% + chloropicrin 15%)
Terr-O-Cide 30D (see D-D 70% + chloropicrin 33%)
Terr-O-Gas 67 (see methyl bromide 67% + chloropicrin 33%)
Thiolux Jet (see sulfur)
Thiophanate-methyl 85 WDG (see thiophanate-methyl)
Thiosperse 80% (CSC) (see sulfur)
Thiram Granuflo (see thiram)

Appendix
Trade Names of Fungicides and Nematicides Listed Alphabetically

Tilt (see propiconazole)
Topsin 4.5 FL (see thiophanate-methyl)
Topsin M 70 WP (see thiophanate-methyl)
Topsin M WSB (see thiophanate-methyl)
Trilogy (see neem oil)
Turfcide 10% Granular (see pentachloronitrobenzene (PCNB))
Ultra Flourish (see mefenoxam)
Uniform (see azoxystrobin/mefenoxam)
Vanguard WG (see cyprodinil)
Vapam (see SMDC)
Vitavax M (see carboxin/thiram)
Vitavax MDC (see captan/carboxin)
Vorlex (see methyl isothicyanate 15% + D-D 85%)
Vydate L (see oxamyl)
Wettable Sulfur (CSC) (see sulfur)
Ziram 76DF (see ziram)
Ziram Granuflo (see ziram)

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
1,3-dichloropropene	Telone	EC
acibenzolar-s-methyl	Actigard	50 WG
aldicarb	Temik	15G
aluminum tris	Aliette Chipco Signature	WDG
ammoniacal copper	Copper-Count N Copper-Count	8 liq.
ammoniacal copper 8% + sulfur 5%	Copper-Count-S Copper-Count-NS	Liq.
azoxystrobin	Abound, Amistar, Heritage, Quadris	2E
azooxystrobin + mefenoxam	Uniform	
azoxystrobin + propiconazole	Quilt	
Bacillus pumilus strain QST 2808	Sonata 3 – Seed Treatment	
Bacillus subtilis strain QST 713	Rhapsody, Serenade	
basic copper sulfate	Basic Copper 53, Cuprofix Disperss	WP
basic copper sulfate + mancozeb	Cuprofix MZ Disperss	
boscalid	Emerald, Endura	
boscalid + pyraclostrobin	Pristine	
calcium polysulfide	Black Leaf Lime Spray Hi-Yield Lime Sulfur Spray Ortho Dormant Disease Control	Liquid Liquid Liquid
captan	Orthocide 50 W Captan 50W Captan 80WDG Ferti-lome Black Spot Control for Roses Captan Fungicide Captan Garden Fungicide	50 WP 50 WP 80WDG 5 D 48.9% 23.65%
captan + carboxin	Vitavax MDC	
captan + fenhexamid	Captevate 68 WDG	68WDG
carboxin + thiram	Vitavax M	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
captan (cont'd.)	Captan Garden Fungicide	48.9%
	American Hi-Yield 5% Captan Dust	4.72 D
	Rigo's Best Captan Garden Fungicide	48.9%
	Hi-Yield Captan Garden Spray	47.3%
	Home & Garden Captan Spray	50%
	Ford's General Purpose Fungicide	25%
	Hi-Yield 50W Captan Fungicide	50 WP
	Security Captan Garden Spray	50%
carbofuran	Furadan	10 G, 15 G, 4F
carboxin	Vitavax	75 WP
chlorfenopyr	Pylon	21%
chloropicrin	various names	100 liq.
chlorothalonil	Bravo Ultrex	50%
	Bravo Weather Stik	5%
	Bravo Zn Fungicide	75 WP
	Daconil Ultrex	
	Echo 720 Turf and Ornamental	
	Equus 720 SST	
	Equus DF	
	Exotherm Termil	
	Ridomil Gold Bravo L {Bravo}	
chlorothalonil + mefenoxam	Ridomil Gold Bravo	
chlorotalonil + thiophanate-methyl	Spectro 90 WDG	90% WDG
clove oil + rosemary oil + thyme oil	Sporan EC	EC
Coniothyrium minitans strain CON/M/91-08	Contans WG	
copper hydroxide	Champ DP Dry Prill	
	Champ Formula 2 Flowable	
	Champion Wettable Powder	
	Kocide 101	
	Kocide 2000	
	Kocide 4.5 LF	
	Kocide DF	
	Kocide-2000	
	Nu Cop 50 WP	
	Nu-Cop 3 L	
	Nu-Cop 50 DF	
	Stretch	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
copper hydroxide + mancozeb	Mankocide Fungicide	
copper hydroxide + mefenoxam	Ridomil Gold/Copper	
copper oxychloride	COC DF COC WP	
copper oxychloride sulfate + sulfur	IAP Copper Sulfur 15-25 Dust	
copper salts	Tenn-Cop 5E	5E
copper sulfte pentahydrate	Copper Sulfate Instant Powder	
cuprous oxide	Nordox	
cymoxanil + famoxadone	Tanos	
cyprodinil	Vanguard WG	
cyprodinil + fludioxonil	Switch 62.5WG	
dichloran	Botran 75-W Fungicide	75 WP
dichloropropene	Telone II	100 liq.
dichloropene 85% + chloropicrin 15%	Telone C-17	Liq.
difenoconazole + mefenoxam	Dividend Extreme Dividend XL RTA	
dimethomorph	Acrobat 50WP	
dodine	Syllit 65W	
Ethoprop	Mocap	10 G *6EC
etridiazole	Home & Garden Terrazole 35% WP Ornamental Fungicide Terrazole 25 Terrazole 35	35WP 25% 35%
etridiazole + pentachloronitrobenzene (PCNB)	Terraclor Super X (EC)	EC
fenamiphos	Nemacur	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
fenarimol	Rubigan A.S. Rubigan AS Turf and Ornamental Rubigan E.C.	50 WP, 12.5 EC
fenbuconazole	Enable 2 F Indar 75WSP	
fenhexamid	Elevate 50 WDG Fungicide	
ferbam	Ferbam Granuflo	76% water-dispersible granules
fludioxonil	Maxim 4FS Maxim Potato Seed Treatment Medallion	
fludioxonil + mancozeb	Maxim MZ	
fludioxonil + mefenoxam	Apron Maxx RTA Apron Maxx RTA + Moly	
flutolanil	Moncut 70-DF Prostar 70WP	70% DF 70% WP
flutolanil + propiconazole	Artisan	
gamma aminobutyric acid + L-Glutamic acid	Auxigro WP	
iprodione	26GT Chipco 26019 Chipco 26019 N/G Rovral 4 Flowable Rovral 75 WG	
kresoxim-methyl	Sovran	
mancozeb	Dithane 75-DF Rainshield Dithane-DF Rainshield Dithane-F45 Rainshield Dithane-M45 Fore-80WP Rainshield Manzate 75DF Manzate Flowable Manzate Pro-Stick Penncozeb 75DF	
mancozeb + mefenoxam	Ridomil Gold MZ	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
mancozeb +zoxamide	Gavel 75 DF	75% DF
maneb	Maneb 75DF Maneb 80WP Manex Manex Fungicide	75% DF 80% WP
mefenoxam	Apron XL LS Ridomil Gold Bravo L {Ridomil} Ridomil Gold EC RidomilRidomil Gold GR Subdue GR Subdue Maxx Ultra Flourish	
mefenoxam + pentachloronitrobenzene (PCNB)	Ridomil Gold PC GR	
methyl bromide 68.6% + chloropicrin 1.4%	Brozone	* gas
methyl bromide 67% + chloropicrin 33%	Dowfume MC-33 Terr-O-Gas 67	* gas * gas
methyl isothiocyanate 15% + D-D 85%	Vorlex	Liq.
methriam	Polyram	80 WP
myclobutanil	Eagle 20EW Eagle 40 WP Laredo EC Fungicide Laredo EW Nova 40 W Systhane-WSP	40 WSP
Myrothecium verruccaria (biological)	Ditera	27.5 ES
neem oil	Trilogy	
oxamyl	Vydate L or C-LV	Liq.
oxytetracycline	Mycoshield	
oxythioquinox	Morestan	25 WP
pentachloronitrobenzene (PCNB)	Terraclor 2E Terraclor 400 Terraclor 75WP	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
pentachloronitrobenzene (PCNB)(cont'd.)	TerraclorFlowable Fungicide Turfcide 10% Granular	
phosphorous acid	Phostrol	
potassium bicarbonate	Armicarb 100 Fungicide MilStop	
potasssium phosphite	Fosphite Fungicide Helena Prophyt	
potassium salts of fatty acids	M-Pede Insecticide	
propamocarb hydrochloride	Banol Previcur Flex	66.5%
propiconazole	Banner Maxx Bumper 41.8 EC Orbit Orbit 45WP (Agpak) Propensity 1.3ME Propimax EC Tilt	
propiconazole + trifloxystrobin	Stratego Fungicide	
pyraclostrobin	Cabrio EG Headline Insignia	
pyrimethanil	Scala SC	
quinoxyfen	Quintec	
SMDC	Vapam	Liq.
sodium hypochlorite (bleach)		Liq.
sodiumtetraborate decahydrate	Sporax	
streptomycin sulfate	Agri-mycin 17	WP
sulfur	Dusting Sulfur-IAP Liquid Sulfur Six Microthiol Disperss Super-Six Thiolux Jet Thiosperse 80% (CSC) Wettable Sulfur (CSC)	

Names and Formulations of Fungicides and Nematicides

Common Chemical Name	Trade Name	Formulations
Tebuconazole	Elite 45-DF Folicur 3.6-F Domark 239 ME Fungicide	
terbufos	Counter	15 G
terrazole	Koban Truban	35 WP 30 WP
tetrachlorothiophene	Penphene	G
thiabendazole	Mertect 340-F	WP; 140-F; 60 WP
Thiopanate- methyl	3336 F 3336 WP OHP 6672 4.5 L OHP 6672 50 W Thiophanate-methyl 85 WDG Topsin 4.5 FL Topsin M 70 WP Topsin M WSB	
thiram	Thiram Granuflo	
triadimefon	Bayleton 50 T&O WSP Strike 50 WDG	
trifloxystrobin	Compass Fungicide Compass O 50 WDG Flint Fungicide Gem Fungicide	
triflumizole	Procure 50WS Terraguard 50W	
triphenyltin hydroxide	Agri Tin Super Tin 80WP Agpak	
triforine	Funginex Ortho Funginex Rose Disease Control	18.2 EC
vinclozalin	Ronilan EG	EG
ziram	Ziram 76DF Ziram Granuflo Fungicide	76 DF

*highly toxic fungicide
WP = Wettable Powder; D = Dust; EC = Emulsifiable Concentrate; G = Granule; L = Liquid; F = Flowable

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Pub. 1802 (2M) 3/06 Rev.

Issued in furtherance of Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. The Louisiana Cooperative Extension Service provides equal opportunities in programs and employment.